THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

Muscles of steel keep these crossings tight

frog and crossing

Reliance **HY-CROME®** *spring washer*

It takes well constructed "muscles" to keep bolts tight in frogs, switches and crossings especially considering the terrific beating administered by two, and sometimes three way, high speed traffic. That is why so many railroad maintenance men are realizing the advantages of using **Improved Reliance Frog and Crossing HY-CROME® Spring Washers.** They have been especially designed and manufactured to withstand the pounding through built in reactive range and pressure great enough to "take it" no matter how great the strain.

Another advantage of these improved spring washers is the wide bearing surface to insure proper contact of the larger crossing nut. In addition, the ground deflected ends make reapplication possible without scoring contacting parts. Write for a call from one of our fastening engineers.

Send for Engineering Bulletin R-53. It will be mailed to you without obligation.

RELIANCE DIVISION EATON MANUFACTURING COMPANY

OFFICE and PLANTS: 661 Charles Ave., MASSILLON, OHIO

Special Steels · Spring Lock Washers · Hex-Fas-Ners®

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

Anchor any frog on your system with this one type of frog plate

Here you can clearly see how any matching pair of Bethlehem Twin Hook Frog Plates fits any tie position under the frog. For cast frogs you can get these plates with "high" hooks; for railbound frogs, use the regular type.

That, for one thing, can mean lower stock-room inventories for you. By standardizing on Twin Hooks, all you'll ever need is one of these two types of plate, in possibly three different lengths. Thus you eliminate the large and confusing array of conventional plates, each of which is designed for a specific tie position.

Another advantage will show up during installation. Twin Hook Frog Plates, being adaptable, erase the problem of which frog plate goes where. Just lay any pair side by side on the tie, engage the frog base with the sturdy forged hooks, then fasten down with ordinary track spikes. It's as simple as that!

And foolproof, too! The hooks on these frog plates are larger and stronger than ordinary spike heads. Once in place on sound ties they really hold. No thrust or lift will loosen or jar the frog out of line.

Standard Twin Hook Frog Plates are available in three lengths: 23, 27, and 31 in. Reverse-hook plates, for use at heel ends, are carried in 27-in. length only. If you wish additional information on Bethlehem Twin Hook Frog Plates, just call the Bethlehem office nearest you.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM TWIN HOOK FROG PLATES

Published monthly by Simmons-Boardman Publishing Corporation, Emmett Street, Bristol, Connecticut, with editorial and executive offices at 79 West Monroe Street, Chicago 3, Illinois; 30 Church Street, New York 7, New York. Subscription prices: to railroad employees only in the United States and Possessions, and Canada, one year $2.00; $3.00 for two years. Single copy 50 cents. Entered as second class matter at the Post Office at Chicago, Illinois under act of March 3, 1879, with additional entry at Bristol. Application for original entry at Bristol, Connecticut pending. Volume 50, No. 12.

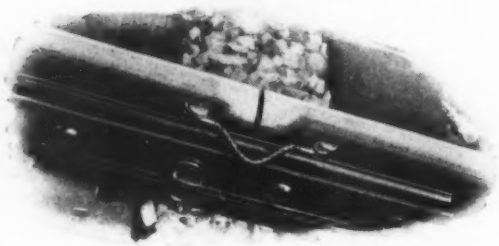
WHAT ARE YOUR REQUIREMENTS FOR END-HARDENED RAIL

Adequate Hardness?

Desired Toughness?

Correct Hardness Pattern?

Best Depth of Hardness



You get all these with LINDE'S methods for oxy-acetylene rail-end hardening

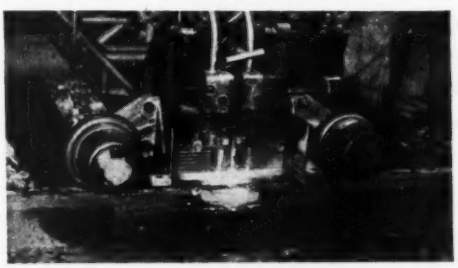
LINDE's methods of flame-hardening are backed by 15 years of experience. During that time millions of rail ends have been treated by this tried-and-tested method.

On many railroads it is standard practice to flame-harden rail ends as new steel is laid. This results in considerable savings because additional flagmen are not required and as the signal bonds are not in place it is not necessary to protect them. On other railroads the manual baffle box method has proved to be efficient, especially for small programs.

You cannot afford to overlook the proved economies of LINDE's end-hardening methods.

Write for Booklet 7007 which details technical data on end-hardening as well as flame-hardening frogs.

Manual baffle box method of end-hardening is useful in places where traffic is dense.



Machine method of end-hardening gives high production at low cost.

RAILROAD DEPARTMENT

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto

"Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

Supplying to railroads the complete line of welding and cutting materials and modern methods furnished for over forty years under the familiar symbol - - -

Low-cost, mobile, air power gives you extra hours of usage

Saves time and money on tie-tamping and many other M/W jobs

ONE man driving Tractair puts 105 cfm of air to work where and when you need it—lets you make more use of work-saving Le Roi-CLEVELAND air tools. On a tie-tamping project, for instance, Tractair delivers enough air to run eight standard Le Roi-CLEVELAND tie tampers.

And it can be equipped to give your men a hand—and cut costs—on other M/W jobs. With attachments, it lifts, loads, augers, mows, backfills, powers a winch, and does the work of other specialized equipment.

Tractair has good traction and low center of gravity. It goes almost anywhere, climbs embankments, works on a two-to-one slope with safety. Tractair also has high clearance. It readily crosses or straddles heavy-duty rail — it's ideal for use in multiple track territory.

The work-equipment officials of many roads can tell you that Tractair is truly invaluable the year around. See for yourself—ask us to show you Tractair at work. And — write for job-data sheets and bulletins.

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.
Railroad Sales Department
327 South La Salle Street • Chicago 4, Illinois

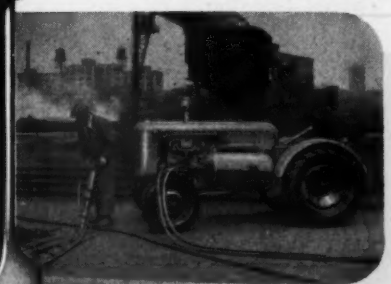
Do all these jobs — and more — with TRACTAIR:

- Tamp ties; drive spikes.
- Break pavement.
- Drive moil point for grouting operation.
- Do ditching, light grading, weed mowing.
- Drive earth augers.
- Stockpile ballast, cinders, other materials.
- Handle off-season work for B&B, Signal, T&T, and Water-Service Departments.

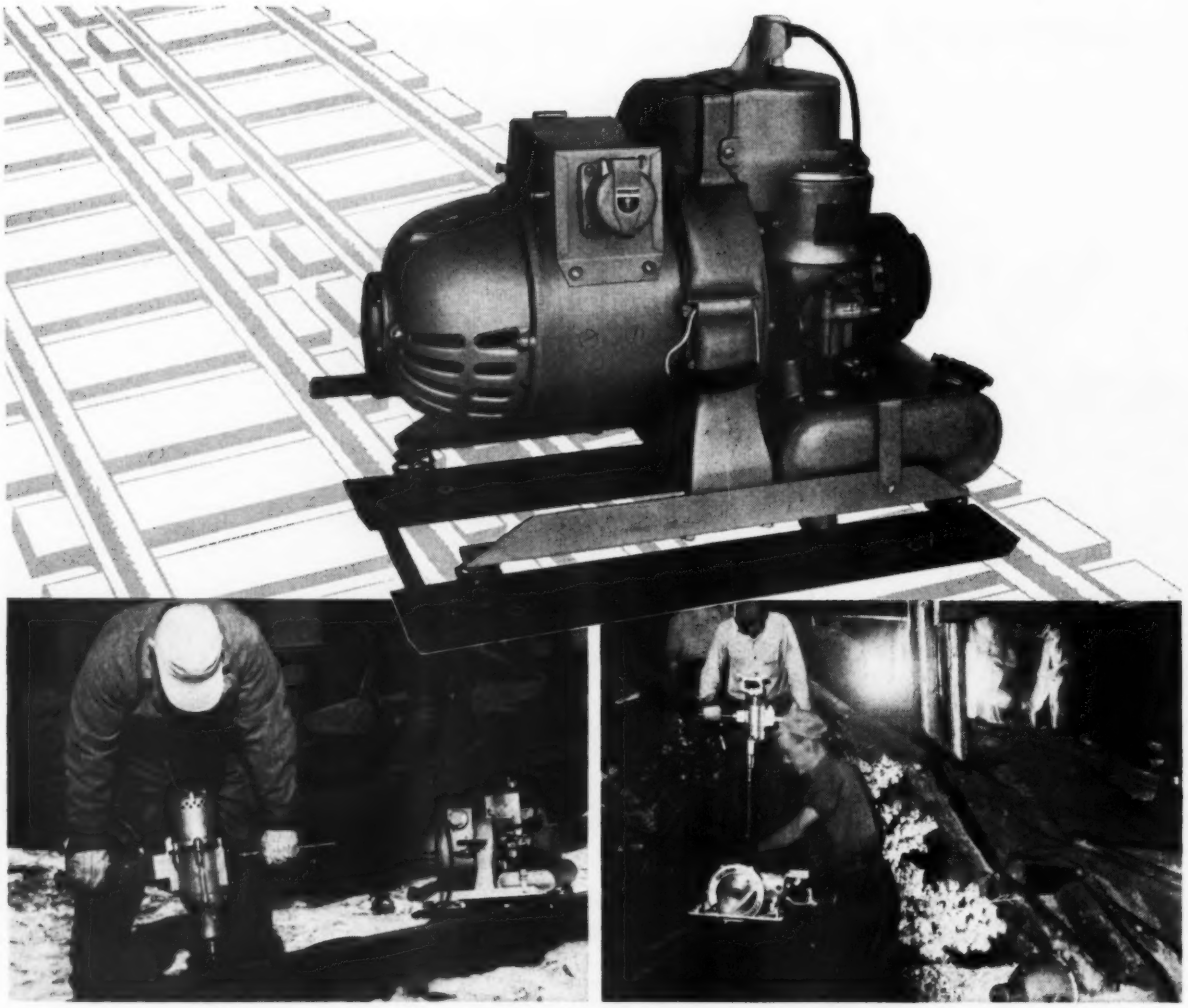
Le Roi-CLEVELAND No. 10 Tie Tamper, shown at left, weighs only 36 lbs. Section hands can keep up with the high-speed blows without tiring. The work is faster and more uniform.

This Le Roi Airmaster Compressor is one of a complete line of portable, heavy-duty gas and diesel air compressors ranging from 60 cfm to 600 cfm. Available in railcar and rubber-tired models.

With the snow-plow attachment, Tractair pays off-season dividends, clearing yards, sidings, loading tracks, access roads. Rotary-broom attachment is available also.



Here, Tractair runs a Le Roi-CLEVELAND Paving Breaker to repair a team track roadway. You can use Tractair to operate other Le Roi-CLEVELAND air tools, also.



A HOMELITE

Gives You "Two Track" Power for speeding maintenance work

It doesn't make a bit of difference whether you're operating high cycle or standard universal power tools . . . you can operate both types from a Homelite Dual Purpose Generator. That's right . . . all types of electric hand tools plus brilliant floodlights, from one gasoline engine driven Homelite Generator that one or two men can carry and put into operation quickly and easily anyplace you need it.

Write today for a free demonstration of how Homelite "Two Track" power . . . high cycle and universal standard . . . can help you. See how it speeds maintenance, simplifies power facilities, and solves the problem of having electric power far from any commercial source.

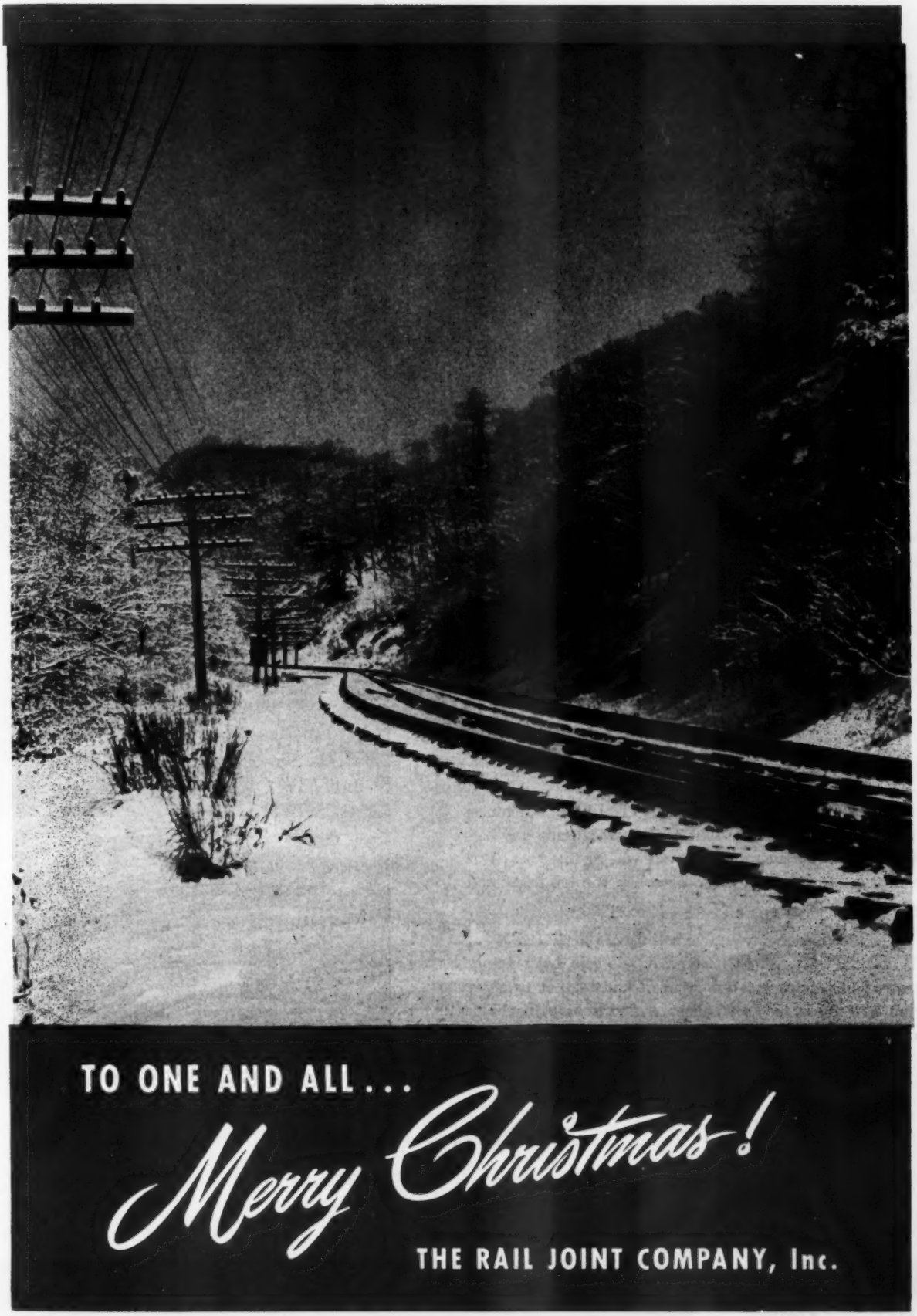
Manufacturers of Homelite
Carryable Pumps • Generators
Blowers • Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE
CORPORATION

212 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Canadian Distributors: Terry Machinery Co., Ltd., Toronto, Montreal, Vancouver, Ottawa


TO ONE AND ALL...
Merry Christmas!
THE RAIL JOINT COMPANY, Inc.

YOU CAN'T BEAT THESE
NORDBERG
BALLAST RECONDITIONING MACHINES

FOR SPEED ECONOMY AND VERSATILITY

CRIBEX®

Removes material contained in the cribs and deposits it beyond the ends of the ties. Leaves a smooth, uniformly-graded tie floor, completely emptying the crib without damage to ties or rail.

BALLASTEX®

Excavates ballast in the area between the tracks or in the shoulder and disposes it by either wasting to the side or feeding it to the SCREENEX for cleaning. Digs a uniform trench 42-in. wide, or any desired depth to a maximum of 30-in. below top of rail.

SCREENEX®

Takes fouled, excavated ballast from BALLASTEX, passes this material over a vibrating Symons Rod Deck Screen and returns cleaned ballast to the track, intertrack, or shoulder in any desired proportions—wasting the screenings to the side beyond the shoulder.

● With these three outstanding Nordberg machines, you have a combination that can solve virtually *any* ballast reconditioning problem. And what's more . . . this versatile "threesome" will accomplish the job *faster* and at *less* cost.

The speed, economy and versatility of the CRIBEX . . . BALLASTEX . . . SCREENEX trio has been amply proved in service in every kind of ballast. Let us show you how these modern ballast reconditioning machines can save time and money for *you*.

For full details, send for a copy of BULLETIN 174.

USE NORDBERG *"Mechanical Muscles"** TO DO A BETTER, FASTER MAINTENANCE JOB AT LOWER COST

*Trademark

Copyright 1954, Nordberg Mfg. Co.

R751-R2

ADZING MACHINE • BALLAST ROUTER • CRIBEX® • BALLASTEX® • SCREENEX® • HYDRAULIC & MECHANICAL SPIKE PULLERS • SPIKE HAMMER • TIE DRILL • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • TRACK SHIFTER • DSL YARD CLEANER • TRAKLINER • DUN-RITE GAGING MACHINE • GANDY—TIE PULLER and INSERTER

NORDBERG MFG. CO., *Milwaukee, Wis.*

Low cost protection for insulated joints

THE BURKART TIE PAD
with the permanent seal

You are looking at an expensive installation on any right-of-way. The insulation in this joint is costly . . . and when it breaks replacement costs are very expensive.

Burkart Tie Pads, installed on joint and shoulder ties of insulated joints, absorb the shock of impact and materially reduce wear and damage to the insulation. Averaging only 15% to 25% of the cost of insulation, the Burkart Tie Pads shown above are truly low cost protection.

Add this to the extra life these pads give to the ties themselves and you have a typical example of why M/W engineers specify Burkart Tie Pads wherever track maintenance costs are high.

SEE FOR YOURSELF how rugged Burkart Tie Pads save money at other trouble spots—on bridge ties, switches, curves, even on your straightaways. Send for sample, prices or additional information. If you wish, an experienced Burkart technical representative will gladly consult with you.

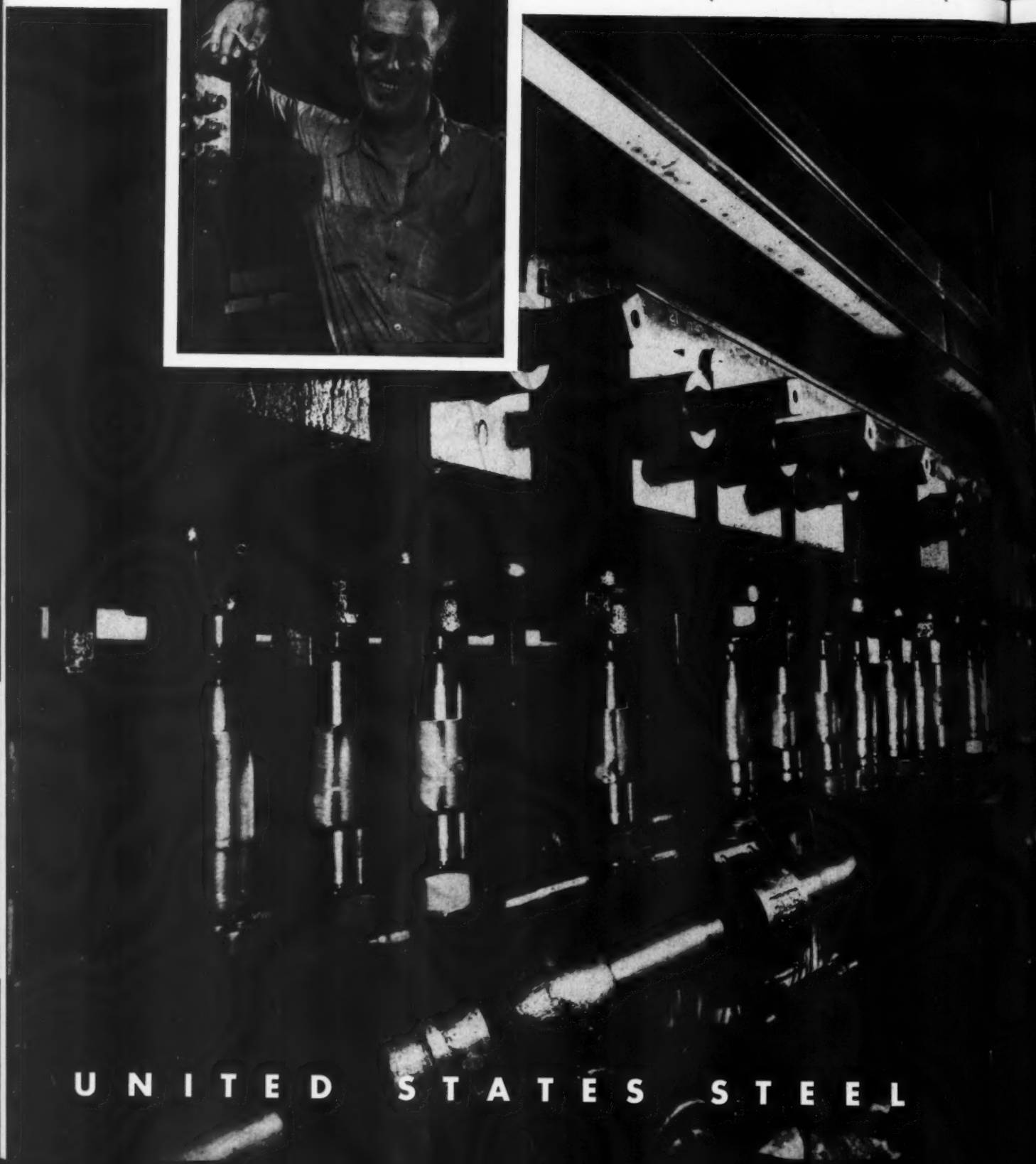
All Burkart Tie Pads are coated to provide a permanent seal.

F. BURKART MFG. CO., Railroad Tie Pad Division

DIVISION OF TEXTRON, INC., 4900 NORTH 2ND STREET, ST. LOUIS 7, MO.

"Precision drilling is a

SAYS *Boyd Baumbaugh,*



UNITED STATES STEEL

a cinch with this machine"

U.S. STEEL DRILL PRESS OPERATOR

THE Multiple Spindle Drill Press that Boyd Baumbaugh operates is one of the most modern machines used in the manufacture of trackwork. In a minute and a half it will drill up to 40 perfect holes in a rail – simultaneously. Once the spindles are positioned and locked, the press will drill hundreds—thousands of identical sets of holes in rails, with no room for human error.

Standing at his remote panel board of 21 buttons and knobs, Boyd completely controls the automatic feeding, positioning, and holding of each rail, plus the feeding and speeds of the spindles, and the withdrawing of each rail after the holes have been drilled.

The purpose of these holes—ranging from 7/16 inch to 2 inches in diameter—is for connecting rail sections, mounting joint bars and reinforcing bars, and attaching other appendages. Although many combinations of hole spacings are required, the spindles in this remarkable drill press can be positioned to meet the specifications of *any* railroad.

Boyd Baumbaugh knows what his Multiple Spindle Drill Press can do—he's been operating it for 10 years. In the past, he's seen service as a welder, trackwork press operator and fitter. All told, Boyd has 25 years' service with U. S. Steel at Johnstown Works—a good solid background in trackwork for the job he does today.

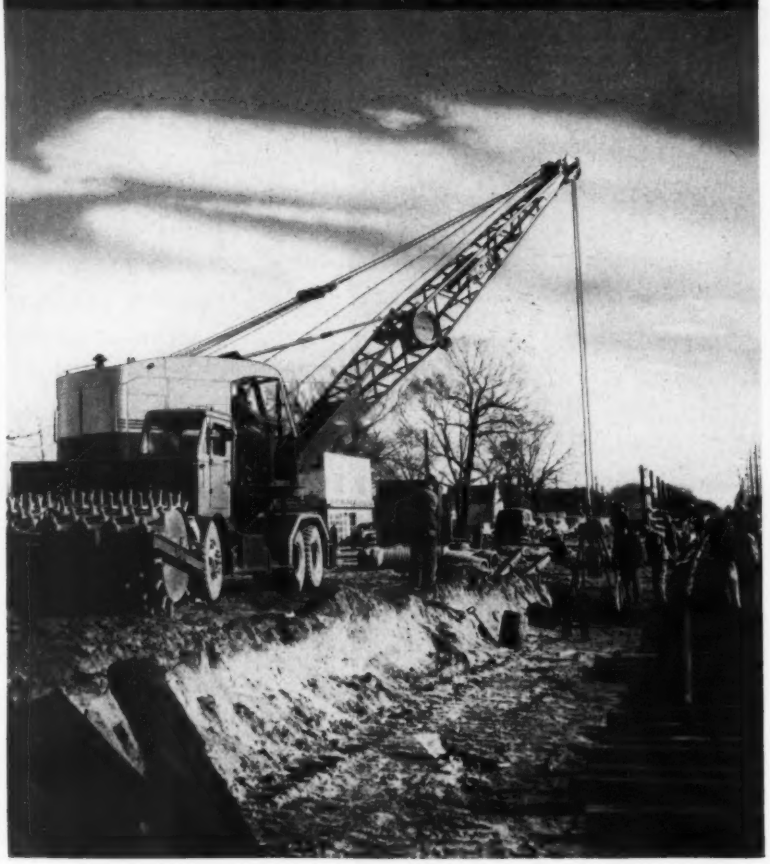
But what does it all add up to—this ultra-modern machine with its confident, experienced operator? Just this—*years of experience, plus painstaking manufacture, make USS Trackwork the finest you can buy.* Write for further information—United States Steel Corporation, 525 William Penn Place, Room 4581, Pittsburgh 30, Pennsylvania.

USS

TRACKWORK

BUCYRUS ERIE

TRANSIT CRANES



Cost-Savers Down the Line

If you're looking for an all round crane-excavator to handle all shapes and sizes of track maintenance jobs, Bucyrus-Eries are a sure bet to help you. Because of their mobility and versatility, they get these jobs done quickly and, in many cases, at far less cost.

JOB MOVES ARE EASY

Carrier mountings, designed for travel at speeds up to 31 mph., provide full stability on any kind of working surface.

EFFICIENCY IS HIGH

No matter what the job, outstanding front end versatility makes it easy to switch from crane to clamshell, dragline, shovel or dragshovel operation with only the simplest machinery changes.

OPERATION IS FAST

Standard Transit Crane features like fully independent power boom hoist, power controlled load lowering, and direct-connected mechanical controls mean responsive operation.

See your local Bucyrus-Erie excavator distributor for full information on the 15-ton capacity 15-B Transit Crane, convertible to ½-yard excavator service, and the 25-ton 22-B Transit Crane, a ¾-yard excavator. A complete line of 3- to 60-ton crawler mounted cranes is also available. 76E54

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

The KERSHAW Track Broom

PROVEN UNDER THE MOST DIFFICULT CONDITIONS

MISSOURI PACIFIC LINES

MO PAC AND KERSHAW WORK TOGETHER TO SOLVE A PROBLEM. . .

DUST STORMS, almost as bad as those in the Thirties, recently threatened main-line tracks on the Missouri Pacific Railroad. Topsoil, blown by heavy winds, became packed between the rails, and the dust had hardened almost to the consistency of concrete.

The danger was that rain might fall, inundating the track and throwing automatic block signals out of operation.

To solve the problem and enable Mo-Pac to retain its reputation of being one of the nation's most reliable and progressive railroads, the Maintenance of Way People called on the Kershaw Track Broom.

Mo-Pac tried the Track Broom for one month on a rental basis. They tried it a second month, on a rental basis. The Track Broom, used behind a scarifier, proved it could do the job of sweeping the dirt from between the rails and depositing it alongside the right-of-way. That removed the threat to Mo-Pac's main-line tracks.

Mo-Pac, after testing and proving the Track Broom, now has purchased outright two of the machines. That's just another example of how Kershaw machines, every day, help the nation's railroads solve their track maintenance problems in the most efficient and economical way.

KERSHAW WILL WORK WITH YOU TO SOLVE YOUR PROBLEMS, TOO. TRY AND TEST ANY KERSHAW MACHINE, WITHOUT OBLIGATION, ON ANY PROBLEM YOU MAY HAVE. YOU'LL FIND IT WILL DO THE JOB, JUST AS IT DID ON THE MISSOURI-PACIFIC.

3 Purchase Plans

Kershaw Manufacturing Co. offers railroads three plans for use of the Kershaw Track Broom and other Kershaw equipment:

1. Three-Year Lease—Lease Kershaw machines for three years.
2. Six to 12 Months Rental with Option to Purchase—Lease a Kershaw machine for six to twelve months. Any time during that period you may purchase the machine, with 90 per cent of rentals applying to the purchase price.
3. Outright Purchase.

Track Talk—
Published every other month
by
Kershaw Manufacturing Co.
Write for your free copy
today.

RECOGNIZE THIS SYMBOL OF LEADERSHIP

KERSHAW
MANUFACTURING CO. INC

KERSHAW MFG. CO., Inc. MONTGOMERY, ALA

Trackwork Equipment Developed and Proven on the Job

KERSHAW KRIBBER • RAIL AND UTILITY DERRICKS • JACK-ALL • TIE REPLACER • HYDRAULIC TRACK JACK • TRACK BROOM • BALLAST REGULATOR, SCARIFIER AND PLOW • MOCAR CRANE • TRACK CRANE • SET-OFFS

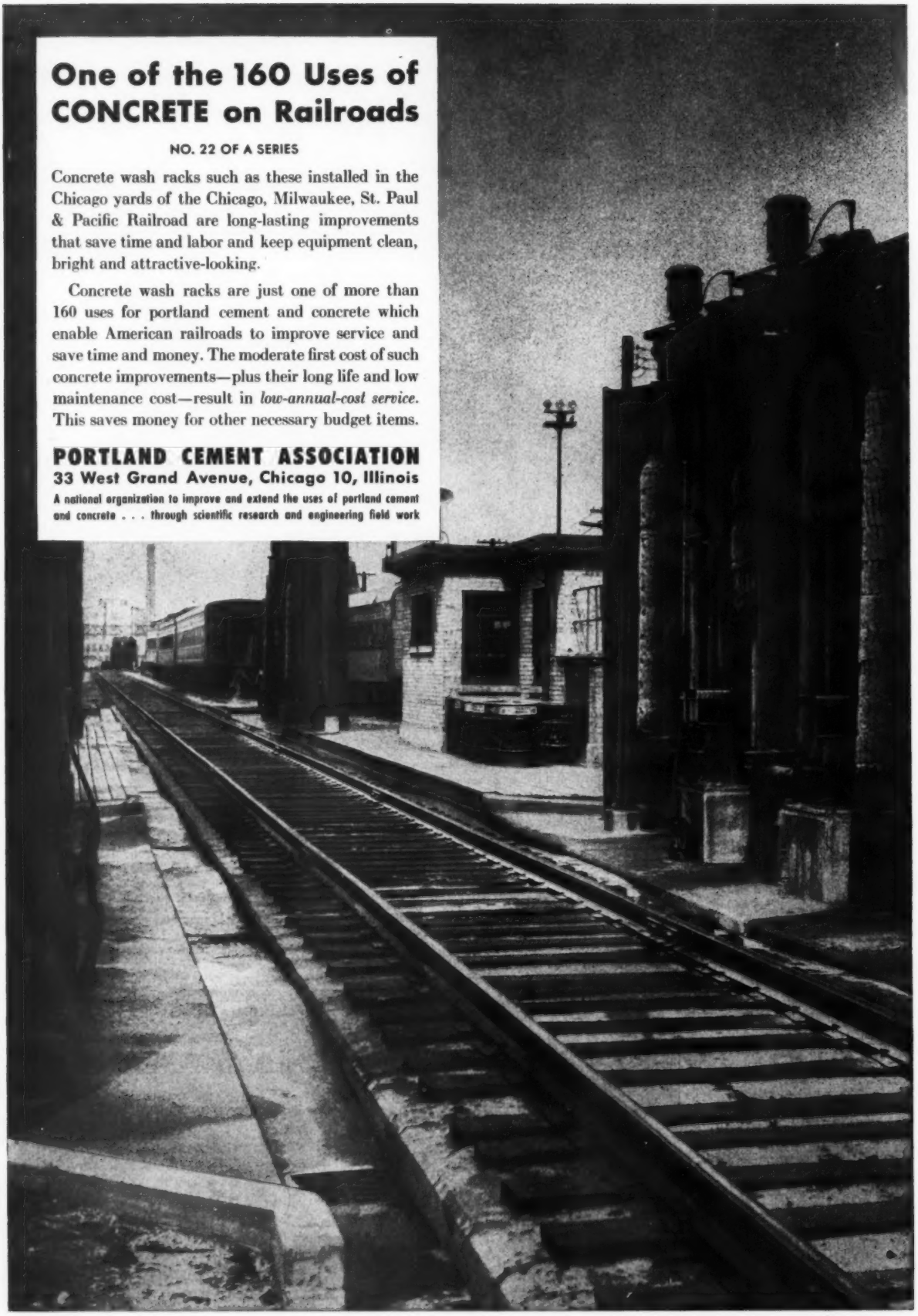
One of the 160 Uses of CONCRETE on Railroads

NO. 22 OF A SERIES

Concrete wash racks such as these installed in the Chicago yards of the Chicago, Milwaukee, St. Paul & Pacific Railroad are long-lasting improvements that save time and labor and keep equipment clean, bright and attractive-looking.

Concrete wash racks are just one of more than 160 uses for portland cement and concrete which enable American railroads to improve service and save time and money. The moderate first cost of such concrete improvements—plus their long life and low maintenance cost—result in *low-annual-cost service*. This saves money for other necessary budget items.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work



Milwaukee Road Completes Major Modernization Project

ROADBED for one of the 70 tracks in the Bensenville yard is roughed out by an INTERNATIONAL TD-14A crawler. All Milwaukee freight cars entering, leaving or passing through Chicago are now switched over the new system.

$5½ Million Bensenville, Illinois, Classification Yard Finished Ahead Of Schedule With IH Crawlers

The world's largest freight classification yard, an installation using both route switching and retarder speed control, has been placed in operation by the Milwaukee Road at Bensenville, Illinois.

The heavy work on this job . . . building new track beds, tower excavations, raising old tracks, custom dozing, even final clean up . . . was handled by two INTERNATIONAL crawlers, a TD-14A with bulldozer and a TD-9 with front-end shovel. With these dependable INTERNATIONAL crawlers on the job, the giant project was finished weeks ahead of schedule.

Whether it's general maintenance work around the yard or a major project out along the right of way, INTERNATIONAL builds a crawler that can do the job more efficiently, with greater economy.

For proof, call your INTERNATIONAL Industrial Power Distributor today. He'll demonstrate the INTERNATIONAL crawler with blade or scraper best for any job, at any site you select.

PART of the Illinois countryside covered by the Bensenville classification yard is to be seen in this view from the hump. Yard has a capacity of 5300 cars.

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

A CURIOUS THING ABOUT THE RAILROAD INDUSTRY

AMERICAN RAILROADS...

ARE PLEDGED TO PROTECT THE PUBLIC *BEFORE PROFITS!*

SAFETY FIRST . . . In good times and in bad, even when costs are rising and traffic declining, the railroads always keep their equipment, roadways and structures safe. Good management dictates that they do this economically, but never to sacrifice safety for profit.

Not only have the railroads pledged themselves to protect the travelling and shipping public by safe operation, but they have dedicated themselves to the acceptance of the country's dependence upon them in times of national emergency. To do this, they must keep themselves strong and ready almost at a moment's notice to *safely* handle very large increases in traffic.

AS USUAL, KEEPING FAITH PAYS "DIVIDENDS"

ADHERENCE TO THIS safety policy costs *more* money at the outset—just as anything better must—but the railroads have been learning recently that it is paying off in unforeseen ways. To keep faith with their pledge, the railroads have been continually searching for new techniques, better methods, more durable materials and more modern equipment. By such "scientific railroading" they now find they have not only made safety and service compatible, but they have reaped "dividends" in ultimately *lower costs*.

MATISA likes to feel that the use of its Tie Tampers, Ballast Cleaners and auxiliary equipment has contributed to this "scientific railroading" and its resultant improvements in safety, service and economy.

Matisa EQUIPMENT CORPORATION

224 South Michigan Blvd. • Chicago 4, Illinois

(This advertisement is appearing in current issues of Financial World)

News Notes

. . . a resume of current events throughout the railroad world

RAILWAY
TRACK and STRUCTURES
DECEMBER, 1954

The New York Central, following the lead set recently by the Pennsylvania, has announced that it will discontinue issuance of annual passes to employees of other railroads traveling on company business. The Central, in turn, will not request annual passes on other lines for its employees. However, it will continue to issue trip passes and half-rate transportation to employees of other roads for vacation travel and emergencies.

•

Nearly $100 million in subsidies will be paid by the government to domestic airlines in the next three years, according to the Civil Aeronautics Board. The Board has estimated subsidies will total $31,550,000, $33,385,000 and $33,337,000 during the next three years, respectively.

•

President James M. Symes of the Pennsylvania has proposed that the federal government return to the railroads the equivalent of its 3 per cent tax on freight transportation and its 10 per cent tax on passenger transportation with the stipulation that the railroads match this rebate dollar for dollar, and earmark the combined funds for roadway maintenance. Mr. Symes made this suggestion in addition to seven other proposals in a recent address before the National Defense Transportation Association in which he said bluntly that "railroads are not now prepared to do the kind of job we would be called upon to perform" in the event of another war—"and will not be prepared to do so if present policies with respect to transportation are continued."

•

The railroads' share of intercity freight traffic, as measured by ton-miles, was only 51.7 per cent of the total in 1953, compared with 55 per cent in 1952. Conversely, the truckers' share was up from 16.2 per cent to 17.4 per cent, and that of water carriers was up from 14.9 per cent to 16.9 per cent.

•

The New York Central has ordered a lightweight passenger train from one manufacturer and expects to order a similar train from a second manufacturer in the near future, according to statements of President Alfred E. Perlman, made in a recent luncheon address to the New York Society of Security Analysts. Mr. Perlman gave no details concerning the new equipment except that the trains will be one-quarter the weight of standard trains.

•

The nation's railroads have declined to arbitrate the demand of the conductors' union for a graduated basis of pay depending on the weight of locomotives. Carrier spokesmen said they rejected arbitration because the request of the Order of Railway Conductors and Brakemen is unjustified, and the current low level of railroad revenues makes it impossible for the railroads to assume any additional expense.

•

A ten-year, $800-million railroad-building program has been started in Venezuela. Plans call for laying 2,640 miles of standard-gage double and single-track line.

•

Four officers of the Chesapeake & Ohio are in Europe studying railroad and maintenance methods and seaport facilities. On the tour, which is expected to last about one month, are M. I. Dunn, vice president—construction and maintenance; L. T. Nuckols, chief engineer, Southern Region; Rudolph C. Tench, special engineer; Atlee S. Richardson, assistant engineer—bridges.

TYPICAL INSTALLATION OF BIRD SELF-SEALING TIE PADS. *On cross ties in open track and on switch ties. At right, a close-up of installation on switch ties. Photographs courtesy of the Richmond, Fredericksburg & Potomac R. R. Company.*

Slash your tie costs 50% with BIRD Self-Sealing TIE PADS

HOW? BIRD Self-Sealing Tie Pads form a waterproof, dustproof seal on the tie that protects the vulnerable area under the plates and around the spikes. Mechanical wear and plate penetration are eliminated.

YOU GET 50% extra tie life from new ties.

YOU GET twice the normal remaining life expectancy from old ties that can be adzed to a smooth surface of sound wood.

YOU SAVE on gauge, line, and surface costs in addition to savings on tie life.

BIRD PROVEN BEST! The original self-sealing tie pad— proven by years of in-track experience.

WHERE?

1. On the joint and shoulder ties of insulated joints.
2. On new or older bridge decks.
3. On switch timbers.
4. Under crossing frogs.
5. Through highway grade crossings and station platforms.
6. On curves to insure holding track to gauge and surface.
7. With smaller tie plates.

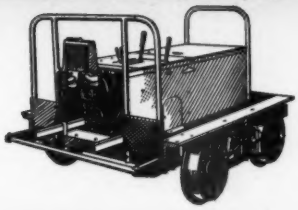
WHEN? Start now. Write today to BIRD Tie Pads, Dept. HTS-12, East Walpole, Mass.

U.S. Pat. 2,686,009

BUY THE BEST BIRD & SON, inc. Established 1795 **BUY BIRD**

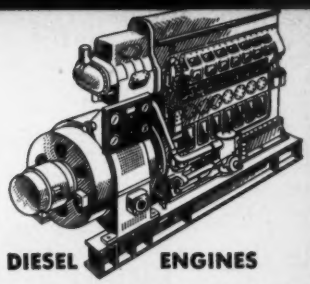
LOCOMOTIVES

. . . from 1200 hp. yard switchers to the newest in motive power, the 2400 horsepower Train Master, the world's most useful locomotive.



RAIL CARS

. . . that have the extra capacity for full crew and tools, the power to do the heavier jobs faster . . . and with greater safety.



DIESEL ENGINES

. . . for dependable off-rail power requirements from 5 to 3600 horsepower. Also, portable lights for signaling, emergency work, and B&B crews.

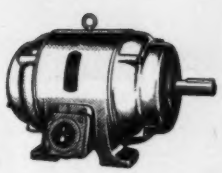
wherever you go by rail you find the FAIRBANKS-MORSE seal of quality on . . .

PUMPS

. . . for fuel oil transfer, up to large-capacity types that drain off flood waters.

SCALES

. . . platform and beam types for weighing small shipments, to large track scales that weigh ore a trainload at a time.



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. . . in locomotives, passenger cars, in the shops and stations, helping to turn the many wheels that are the railroad industry.

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for more than 120 years it's

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a name worth remembering when you want the best

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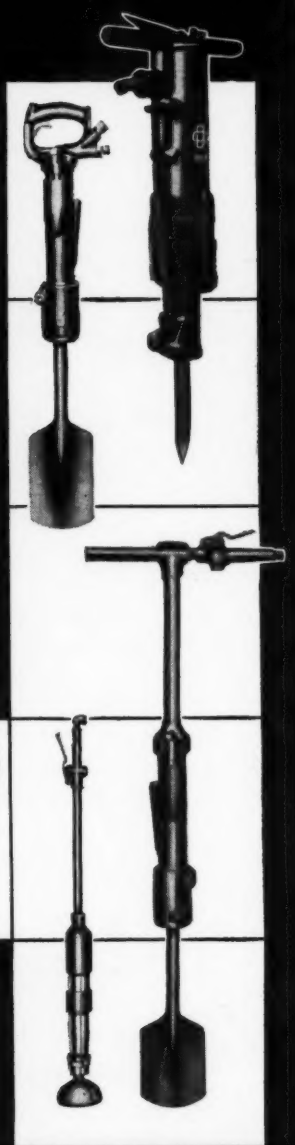
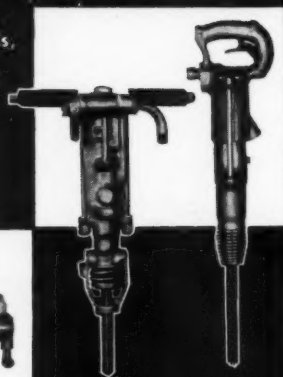
3 reasons **why** it pays to standardize on **GARDNER-DENVER air tools**



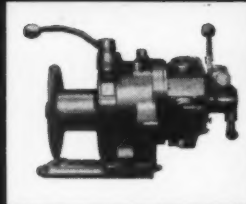
1 **they fit the job**
Field-proved for years on track and bridge work, plant maintenance and construction projects.

2 **they suit the men**
Well proportioned and correctly balanced—enable your men to accomplish more work, and with less fatigue.

3 **they stay out of the shop**
Precision design, tested materials, easily renewable wearing parts keep Gardner-Denver air tools on the job.

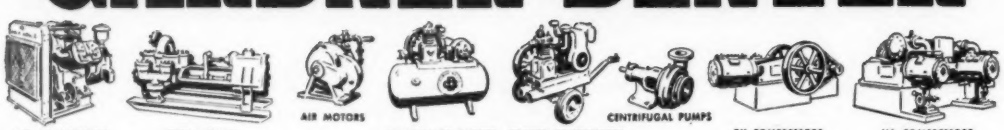


Write for descriptive bulletins.



SINCE 1859

GARDNER-DENVER



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Gardner-Denver Company, Quincy, Illinois

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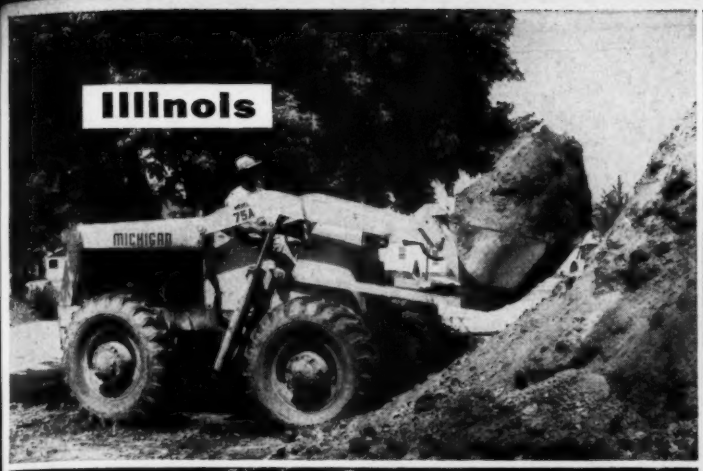


Why the **MICHIGAN*** Tractor Shovel moves bigger yardage – *the Clark Torque Converter®*

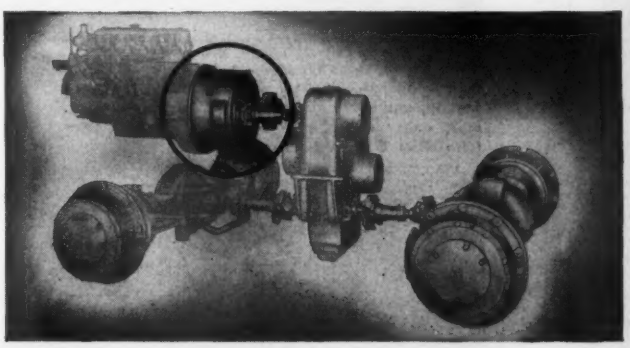
You can do miraculous things with a MICHIGAN* Tractor Shovel because of *extra power when it's needed*—a result of 3-to-1 torque multiplication in the CLARK Torque Converter.

● **Digging into TOUGH Material**—watch a MICHIGAN *force* its bucket into tough, compacted material: not a "shock" action—but a steady, resistless flow of *increasing power* that puts no punishing strain on the driving shafts and gears. Torque multiplication plus the terrific digging power of the hydraulic bucket rams enable the MICHIGAN to perform unbelievable feats.

● **Maintenance and Down-time reduced to a minimum**—the CLARK Torque Converter eliminates the engine clutch: the weakest link in a conventional power-train and the unit most frequently requiring repair.

● **Make ANY Shift at ANY Time**—with the Torque Converter, driving is as easy as handling your car! Shift into Forward or Reverse, into High or Low range *while moving in either direction* . . . the Torque Converter absorbs shocks.

● **Standard Equipment on All Models**—Clark is first to present a full line of Tractor Shovels with Torque Converter as standard equipment. See the MICHIGAN Tractor Shovel. Watch it in action, demonstrating its astonishing power, speed and maneuverability.



Talk to your MICHIGAN dealer; and send for the MICHIGAN Fact Folio, handy file of specifications and action photos—the coupon gets prompt action.

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CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY 19C
Construction Machinery Division
492 Second Street
Benton Harbor, Michigan

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"All other hauling methods more expensive" report Blythe Brothers

14 D Tournapulls handle long hauls "cheaper than trucks" on railroad job

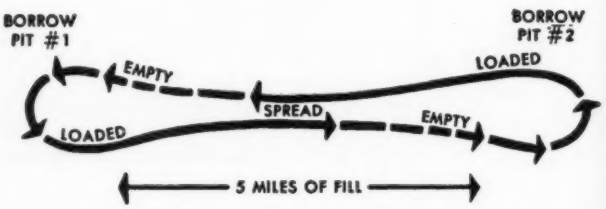
BLYTHE BROTHERS COMPANY, Charlotte, North Carolina, contracted with the Navy Bureau of Yards and Docks to build 28.85 miles of single track railroad for a southeastern Marine Corps training base. Of the million cubic yards involved in the project, most difficult phase was construction of a 250,000-yd. fill over 5 miles of swamp. Fill, mostly sand and sandy loam, was made 20′ wide on top, averaging 5′ in depth, with a 40′ base.

Blythe Brothers studied and field-tested many types of equipment before beginning work on this section. Trucks were tried, but didn't work out because they couldn't get through the soft footing without constant tractor assistance. Hauls were too long for crawlers. Fills were too narrow for most self-propelled scrapers. Then Blythe Brothers tried D Tournapulls. These did the trick. "D's" had the ability to pull through the soft fill and turn on its 20-ft. width. Top haul speed of 28 mph made them economical even on hauls of 2½ miles or more. So, the Company rented 6 "D's" to add to their own fleet of 8 . . . assigned all swamp work to the 14 Tournapulls and several draglines for sidecasting.

Two major reasons for selecting D Tournapulls were their ability to "go-anywhere" in soft, spongy footing, and make high-speed turns on narrow fills. Most units were driven to job under own power from cities 60 to 70 miles away.

2 loads hourly on 10-mile cycle

With only 2′ to 3′ to the water table in the borrow pits, and despite rain nearly every day, the rubber-tired units



At start of project, draglines mucked out 2½′ on both sides of fill, wasting it along sides. The "D's" then started at one end of embankment area, placed 3′ of sand lift along entire 5-mile stretch. "Figure-8" operation was then started with units hauling material from borrow pits at both ends of fill.

FOR LOWEST-NET-COST-PER-YARD

LETOURNEAU

consistently loaded 6.5 pay yards of root-laced dead sand. Working a "figure-8" pattern totaling 10 miles, each "D" delivered 2 loads per 50-minute hour. Haul and return speed averaged 12 mph.

Says Project Manager George F. Thibodeau, "Other hauling methods were studied, including trucks, and actual field trials were made. All were found to be more expensive than the D Roadster operation."

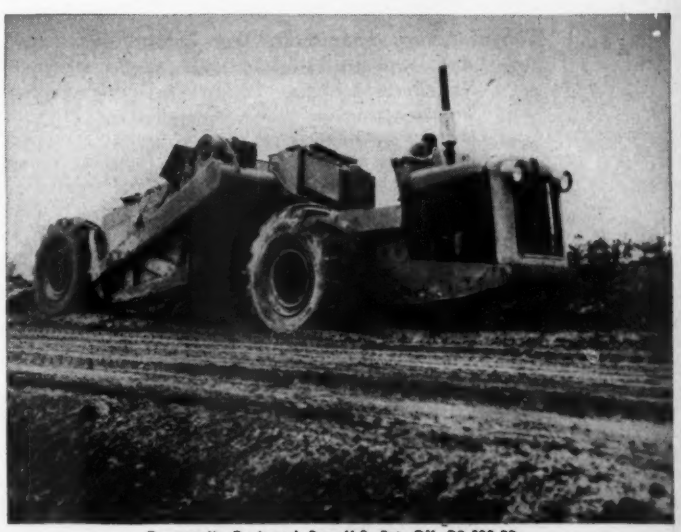
Excellent planning and supervision

Efficiency was increased, field engineers report, by Blythe Brothers' excellent initial planning, plus a rigidly-followed maintenance program. Despite adverse conditions, the haul road was maintained and sprinkled constantly. Every detail of the job showed alert supervision to help equipment deliver maximum output.

Ask your LeTourneau-Westinghouse Distributor for literature on how to increase *your* job efficiency. He will be glad to help you, any time. He will also demonstrate Tournapulls on your job. Make a test. You'll find the 7-yd. 122 hp "D's" have ample capacity to work profitably in pusher fleets. They also have the self-loading ability to economically handle scattered finishing and other one-man odd jobs. Every dirtmoving job needs at least one "D" as a "handy man".

Push-loaded, Tournapull with 1-ft. sideboards, gets 6½ yds. of dead sand and sandy loam in less than 45 seconds. The "D's" worked a "figure-8" cycle, loading at both ends of the 5-mile fill.

Spread, taking only 15 seconds, is made on the run at 20 to 25 mph. According to Blythe Brothers, the "D's" have delivered 3 loads per hour under best conditions over the 10-mile, 2-load cycle . . . averaging 18 mph on haul and return.



Tournapull—Trademark Reg. U.S. Pat. Off. DP-528-RR

LeTourneau-Westinghouse Company

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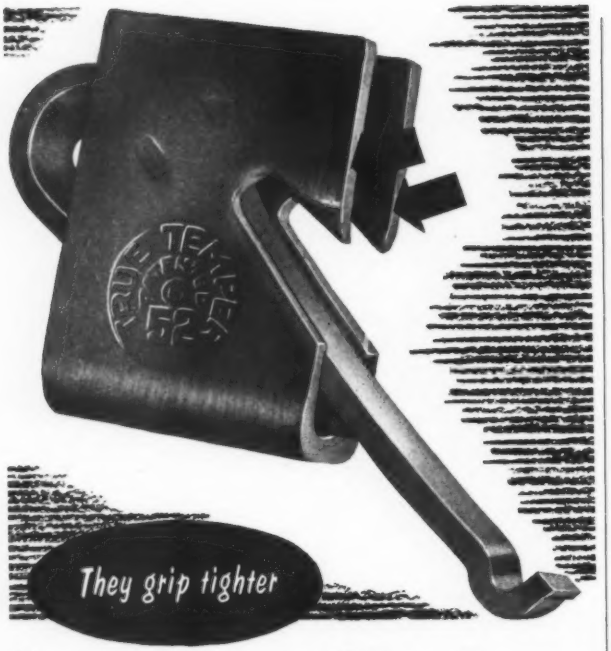

Save money with True Temper double-jawed RAIL ANCHORS

● The most important feature of a rail anchor is its ability to grip the rail so tightly that it cannot slip or creep. One look at the True Temper anchor will show you why it grips more firmly.

Note the double jaws . . . designed to anchor the rail at two points. Note the broad, heavy flange that presents a greater area to butt against the tie. And note how easily it can be positioned for accurate driving.

Consider, too, these extra True Temper features:

Apply with any standard striking tool
Not affected by frozen ballast
Greater protection in case of derailments
Impossible to overdrive
Better fit on worn or corroded rails
Easy and safe to re-install

TRUE TEMPER®

Railway Appliance Division • Cleveland, Ohio

TRUE TEMPER RAILWAY TOOLS

BRIDGE TIMBERS LAST LONGER COST LESS...

WHEN THEY'RE SPOT-TREATED WITH **OSMOPLASTIC**

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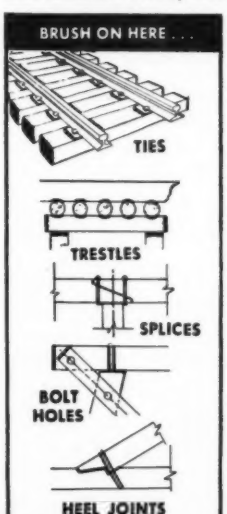

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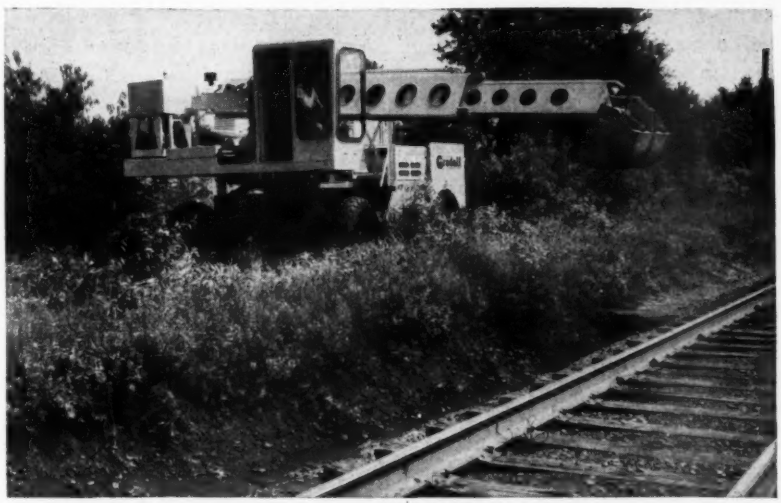
off and on-track maintenance work with the new

RAILROAD GRADALL

New Gradall goes anywhere. *With oversize tires and power steering it moves right over track, or over rough terrain.*



Works off the track or on. *Gradall's hydraulic, telescoping boom reaches full 24 feet—36 feet with boom extension*—for its precision work. Operator can even work to hand-finish "specs."*

Now one machine does all these jobs

- Cleaning tracks and roadbeds
- Trenching and Backfilling
- Maintaining drainage ditches
- Widening cuts and fills
- Ripping old pavement
- Sloping and Grading
- Excavating
- Laying rails
- Hand finishing

YES, the new railroad Gradall has *proved* it can do all these jobs—and many more—*faster, better, at less cost!*

This new multi-purpose machine is especially designed for railroads with oversize track-climbing tires, power steering, an extra-rigid H-beam frame, and remote control from operator's cab* for one-man operation.

It speeds jobs like track or ditch cleaning. One Gradall does them faster than a whole crew of hand laborers. It works off the track or right from the roadbed—moves off the track instantly, never interrupts traffic.

Gradall does the job better, too. Its telescoping *arm-action* boom gives the operator such complete control of the tool he can even work to hand-finish "specs."

And it moves fast from job to job—down the tracks or by highway. It covers every mile of your track—works in, or out of, places no other machine can reach. It doesn't require a work train.

This new Gradall pays for itself fast, too! A single investment gives you a machine that does the work of many. It's always busy—carrying its own quickly interchangeable attachments so it's always ready for the "next job."

But see for yourself. Write us to arrange a demonstration on your own work. Address: The Warner & Swasey Co., Gradall Division, Cleveland 3, Ohio.

**Optional equipment.*

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Subject:

Dear Readers:

RAILWAY

TRACK *and* STRUCTURES

Editorial Opinion

Occasionally we are asked by a reader why we don't take a stronger position regarding some particular development in the field. When this happens we go to some pains to explain the functions of trade journals as we see them, and for the benefit of all of you it might be worth while to set down here some of the guiding principles that shape our editorial policy.

It is important to point out first that a trade magazine serves, in its specialized field, the same purpose as does your daily newspaper in covering events of general current interest. Tonight when you are reading the paper you will notice that the news articles not carrying "by-lines" do not express opinions unless they are attributed to someone else. In writing such stories newspaper reporters are permitted only to set down the facts as they find them. If they wish, they may include the views of others, but the wording must be such as to indicate plainly the source of these opinions. For one reason or another it is often not desirable to mention names in this connection, which explains the frequent usage of such phrases as "it is expected in some quarters . . ." or "an authority on the subject stated . . ."

In reporting developments in the maintenance-of-way field, we, as trade paper editors, are governed by the same rules as those applying to newspaper reporters. Feature articles and news stories must reflect only what we see and hear; expressions of our own opinion are not permissible except perhaps in cases where circumstances point to an obvious conclusion.

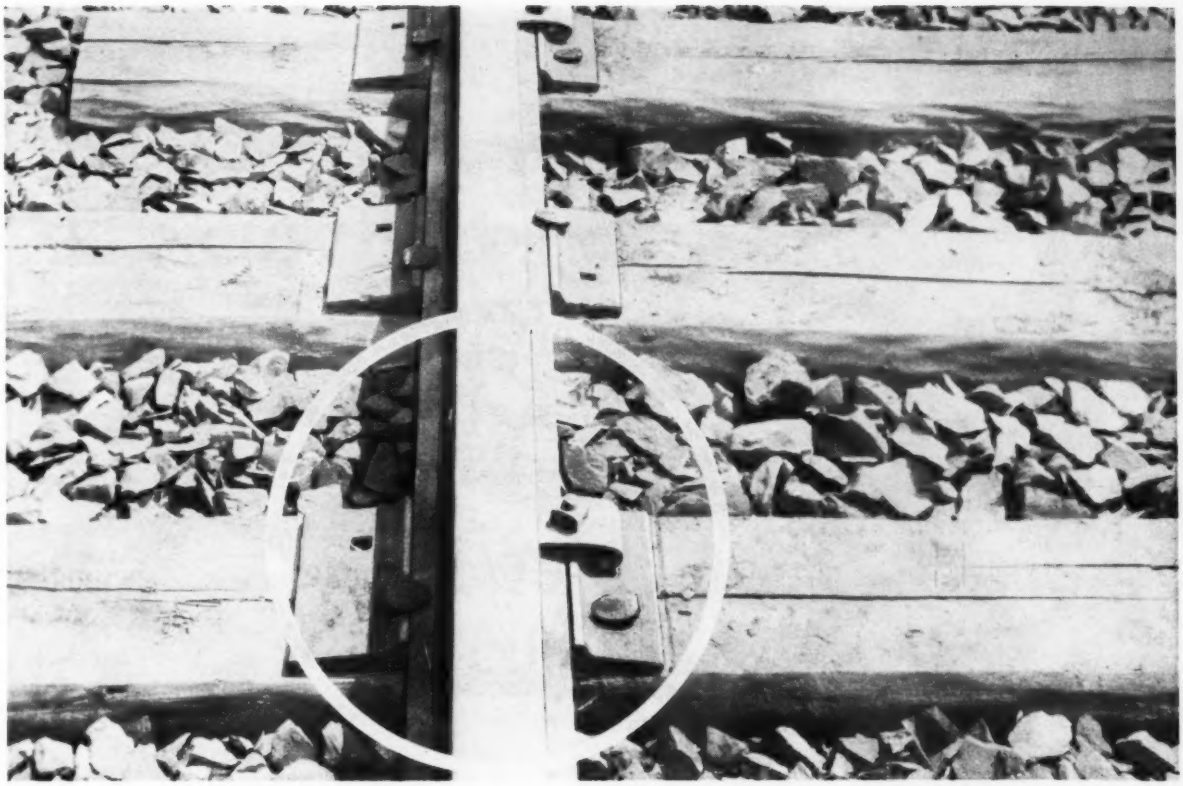
At the same time the trade paper is supposed to perform the role of leader in its field. One way in which we can live up to this obligation is by ferreting out developments which are felt to be outstanding in one way or another and publishing factual articles regarding them. The editor is exercising leadership when deciding which developments are worthy of such treatment. Having a sort of perspective view of his entire field, he is in a position to anticipate trends and to select material accordingly.

Another way in which the editor can exercise leadership is by the direct expression of his own opinions in editorials. Practically every newspaper and magazine has one or more columns or pages on which the editors are free to speak their minds. In our magazine we have two pages for this purpose. One is the page you are now reading, and the other is the one labeled "Editorial Opinion" (page 29 in this issue).

I say that the editor is "free" to express his own opinions on the editorial pages, but even here he encounters restrictions. These derive largely from a fear of "sticking out his neck." To win and hold the confidence of readers it is necessary for the editor to use sound judgment in taking a position editorially. His ideas must be progressive, but not radical. He must keep his feet on the ground, but at the same time he must endeavor to explore and suggest new lines of attack or investigation; otherwise his editorials will be of little interest and of no value.

For these reasons editorial writing is a difficult chore. On the other hand it can be a stimulating experience in creative writing, which has its rewards, especially when readers are moved to express their own opinions, pro or con.

MHD



COMPRESSION ANCHORS Are Better for Maintaining Line and Gage

Here's Why...

The above picture, made on busy main line track, is revealing. Note in particular how closely Compression Rail Anchors hold the rail to the outside shoulder of the tie plate. As every trackman knows, close, uniform holding of the rail in the tie plate is important in maintaining line and gage. This in turn means better running track—joints are held in line and spotty wheel flange wear is avoided. There is less wear and tear on ties, tie plate shoulders and rail.

The RAILS Company

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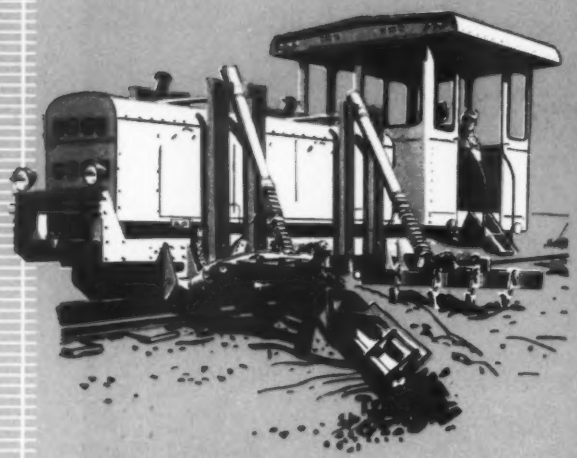
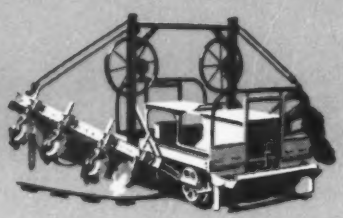
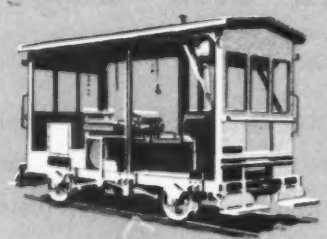


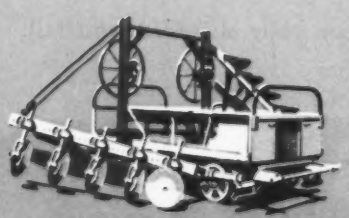
W77 SERIES A Ballast Maintenance Car features a 112-h.p. engine with eight speeds and two-way, four-wheel drive. By mounting scarifiers, discs, center plow, ballast equalizing box and two sizes of blades, it handles the entire ballast maintenance job.



M25 SERIES D Ballast Discer, an unusually economical unit in both cost and maintenance, does a good job of maintaining shoulder ballast. Features include a heavy-duty, truck-type transmission and four-speed, two-way operation. Discing equipment can be detached, thus freeing the unit for gang service.



M23 SERIES E Ballast Drainage Power Unit is ideal for discing, blading and scarifying. It is powered by a rugged 75-h.p., 6-cylinder engine and offers four-speed, two-way operation. It is unusually thorough, economical and dependable in its operation.



W62 SERIES A Ballast Discer is a self-propelled unit that provides an efficient, economical method of improving track drainage, re-shaping shoulders and aiding in re-ballasting and tie renewal programs. Features include five 18" discs, full depth operation.

IS YOUR PROBLEM Ballast Maintenance?

You'll find the answer at Fairmont

As the industry-source for railway maintenance equipment, Fairmont has recognized its obligation to provide the perfect product for every maintenance assignment, regardless of scope or size. This, of course, is true in every phase of railway maintenance — but it is particularly evident, we think, in the field of ballast maintenance. The illustrations on this page alone bear eloquent testimony to this fact. For here you see Fairmont products ranging from the giant, all-encompassing W77 Series A to the compact M25 Series D Discer—representing a complete range of ballast maintenance equipment. Different as they are in their purpose and in their operation, you can be certain of lasting performance, of continuing dependability and of enduring value, regardless of the unit you select. If Ballast Maintenance is your problem, we invite you to contact us for detailed information. We've got the answer—and we are at your service at any time!

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RAILWAY

TRACK *and* STRUCTURES

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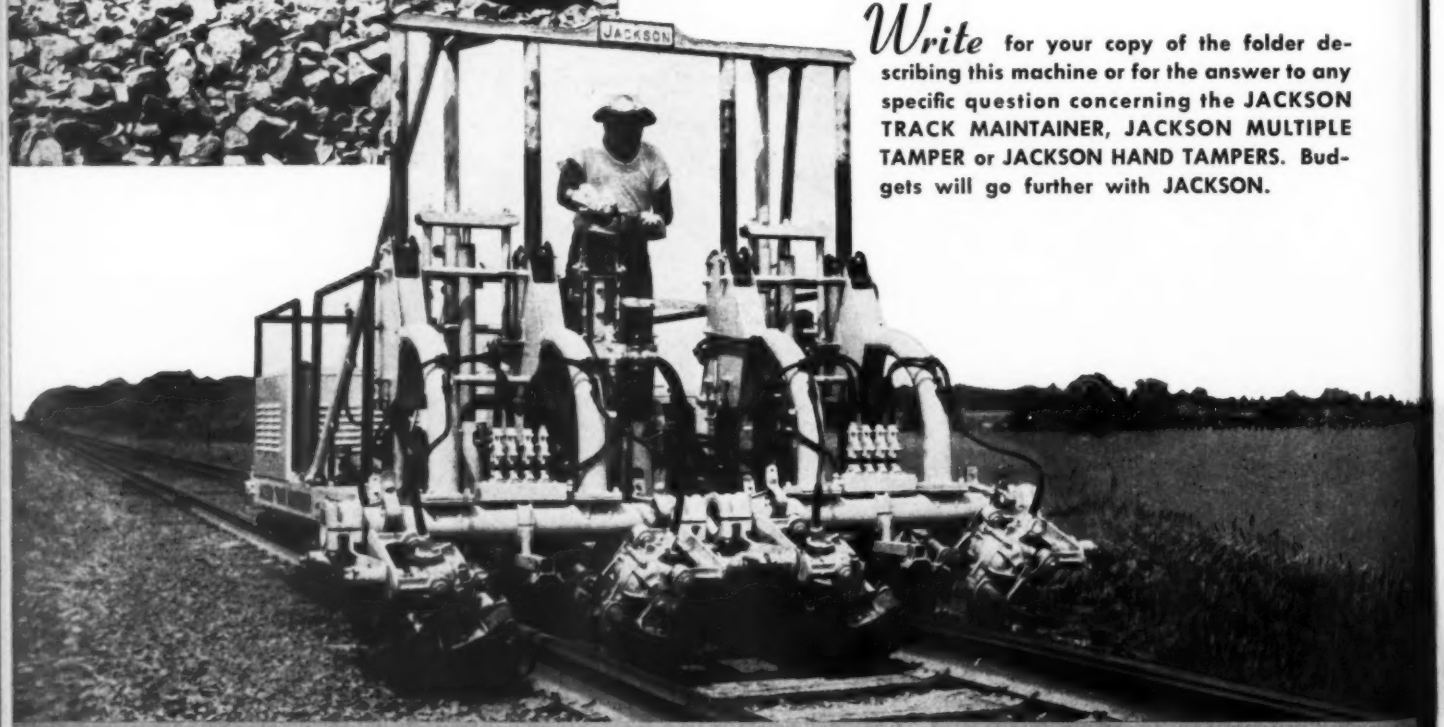

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JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN

Mainspring of Ingenuity

In one sense anyway, railroads are like people—they may be "rich" or "poor" or in the "middle-income" group. Maintenance-of-way men who work for rich railroads may occasionally be regarded a little enviously by their contemporaries on other lines. "If I worked for a wealthy road," they say, "I too could go in for some of these fancy methods and machines, but as it is my employer is too poor to afford such luxuries."

There is certainly some justification for this viewpoint. Even though a relatively poor railroad suffering from low traffic density may not have to maintain its properties to the same standards as a wealthier neighbor, it dare not permit the physical condition of its plant to fall below certain minimum standards. At the same time, such a railroad, like a low-income family, would soon go broke if it attempted "to keep up with the Joneses."

It can hardly be said that the maintenance man on any railroad is on easy street these days, but those on the poorer roads are relatively worse off. They are caught on the horns of a dilemma produced by skimpy allotments on the one hand and the insistent demands of the property on the other. There is only one way for them to make their position more comfortable, and that is to call into play a larger measure of ingenuity in developing cost-saving practices. The fact is that many maintenance practices now in general use originated on so-called poor railroads.

Recently, a maintenance officer of one of the less-affluent roads expressed the opinion that he would not be proud to have his standards and practices inspected by representatives of other lines. As a general proposition, wouldn't it seem that M/W officers of the more prosperous roads would possibly have much to gain by finding out what their less fortunate colleagues, driven by a greater need for economy, are doing to make ends meet?

A New Measure of Performance

A method of analyzing the various factors which taken together make up such barometers of railroad efficiency as the maintenance ratio, transportation ratio and operating ratio was set forth in an article which appeared in the November 1 issue of *Railway Age*. This article, by W. R. McLean, analyst for the Interstate Commerce Commission, outlines a method for determining a set of index numbers which can be used in evaluating the influence of each of the component sub-accounts on the various overall ratios. It is held that the trends of these indicies over a period of time, or comparisons between indicies included within an individual ratio with corresponding indicies for other roads, are valuable aids in discovering operating inefficiencies.

It is pointed out by the author that, although two railroads may have maintenance ratios that are quite close together, this does not necessarily prove that these roads are equally efficient. There is a possibility that one or both of these roads may have a categorical item out of line which balances out a categorical efficiency in another account, with the result that the inefficiency would not be discovered if only the overall ratios were compared. However, a comparison of the details would suggest where scrutiny is needed.

Mr. McLean points out that, while the necessary figuring required to arrive at these indicies would probably be too much for just one man to do, a central agency of the railroads could do this for all roads at a nominal figure. It is his opinion that such expense would be quickly repaid many times over by the resulting attention to many details of expense which are now overlooked because of the lack of a yardstick with which to measure them.

Mr. McLean's article is recommended reading for higher maintenance officers.

The Art of Track Surfacing . . .

Part 1 — Learning the Fundamentals

Like track lining, track surfacing is a task that needs to be taught, and taught properly, if proficiency is to be attained. Track foremen should be more active in teaching track raising to promising men. This should start with the process of "jointing up," and proceed from there to the fundamentals of raising a length or more of rail, of spot surfacing, and of raising without grade stakes.

By Leo C. Blanchard

Roadmaster
Chicago, Milwaukee, St. Paul & Pacific
Minneapolis, Minn.

● Track raising, or track surfacing, can be taught just as track lining can be taught. Many persons hold to the belief that track liners are born and not made. If such were the case the same could be said of track raisers since the experts in both fields have a great deal in common. Some men may be born with certain qualities that make it easier to learn these skills, but each must be developed, first through proper understanding of the technique involved and, second, by plenty of practice. Most track raisers have a desire to learn and need only a little encouragement. A few are forced into it by circumstances not of their choosing.

More and more, roadmasters are complaining of the lack of properly qualified replacements for track raisers, track liners, machine operators and track foremen. It is unfortunate that, through the lengthening of territories, reduction of forces and tightening of work schedules, our foremen feel so responsible for production that they no longer have the time or the patience to teach a promising candidate the skills required for these positions. Many times I have watched young men come onto sections or extra gangs filled with a desire to learn and to get ahead, only to have this enthusiasm dampened by an unsympathetic foreman.

My introduction to track surfacing came about shortly after I started work on the section in 1920. My foreman was a young man in his early twenties and very proud of his status as a "boss." One day, while surfacing track and being somewhat tired of performing the gandy dance on a No. 2 shovel, I dropped down to sight the rail to see just what we were doing. This foreman immediately yelled at me: "Get on your cockeyed feet, you're hired to tamp the ties. I will do all the track raising and all the thinking around here. You just do the work I tell you to do." I was properly squelched and, had I continued to work for him, he would have taught me to wield a shovel, a pick and a spike maul and very little else. My chief interest in the railroad would have been quitting time and pay day, just as it is for so many who are unfortunate enough to have this type of foreman.

Let Subordinates Help

The most successful foremen are those who have one or more potential foremen working for them, ready for promotion as soon as a job opens. Likewise a roadmaster's job is made easy if he has several potential roadmasters working for him. Why so many fail to understand and take advantage of this is beyond comprehension. There is a gold mine of ideas in our fellow

SMART SUPERVISORS train as many men to replace themselves as possible. Successful foremen have one or more potential foremen working for them.

Why Be an Expert Track Raiser?

"These articles are written especially for the section foreman, assistant foremen and others who are interested in advancing themselves or increasing their knowledge of the subject. The young man who is ambitious should make every effort to get started as a track raiser. It is exciting and interesting work. The expert track raiser and the expert track liner are cut from the same cloth and are of the stuff to which management looks for its future supervision. Track raisers and track liners have the self confidence that enables them to become good rail men, switch men, work-train foremen, track foremen and eventually roadmasters. But whether you desire such promotion or not, there is no greater satisfaction than to be able to look back over a piece of beautifully surfaced track that you have achieved by your own skill as a track raiser."

workmen's minds to help us as superyisors if we would just reach for them.

Instead of being afraid that the men under him might get to know as much about the job as he does, the smart supervisor trains as many men to replace himself as possible. Many men have failed to get further promotions simply because they are unable to recommend anyone to replace themselves. The forward-looking supervisor gets as many trained men around himself as possible. It is much better if you have men breathing down your neck for your job.

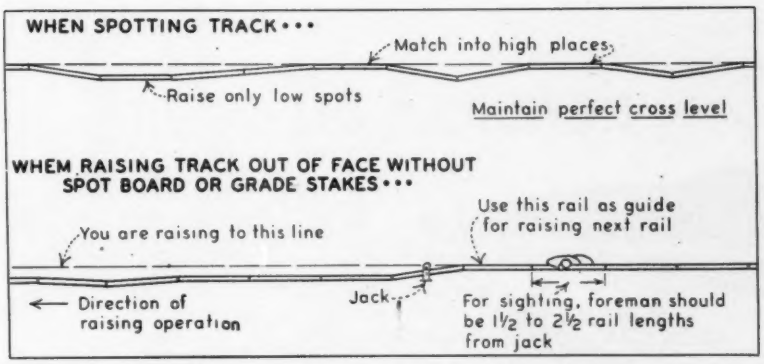
Section foremen, general foremen of large terminals and extra-gang foremen frequently complain that they can be in only one place at a time and can't watch everything. That is true if they try to do everything themselves. An efficient foreman trains men to fill key positions so that he himself is free to handle the overall problems of the job. For such a man no job is too big.

Foremen frequently say: "There is no one in my gang capable of being trained for greater responsibility." Once in a while that might be true, but I have been surprised so often by the way men respond to a little encouragement and when given a little responsibility, that I feel no man should be condemned as a hopeless case until every effort has been made to stimulate his pride and self confidence. So very much depends on the way men are handled.

You have seen cases where an older foreman would retire and a new foreman would come on the job. Almost immediately you could sense a new feeling of importance among the laborers as they rose to the occasion to help the new foreman get his feet on the ground. Sometimes the new foreman would shortly begin praising these laborers as some of the best he ever worked with. Later you would expect such a group to produce an assistant foreman, all because of a change in atmosphere.

Train Member of Gang

What has all of this got to do with raising or surfacing track? Simply this; you have to pick someone out of your gang and teach him what he needs to know, so that in due time you can send him out to do track-raising or other jobs for you on his own, knowing that he will do the work as you would want it done. You will have to be able to let him make a few mistakes without losing your patience and becoming angry. He will learn from these mistakes and with understanding will gain confidence.


WHEN SPOTTING TRACK • • •
Match into high places
Raise only low spots
Maintain perfect cross level
WHEM RAISING TRACK OUT OF FACE WITHOUT SPOT BOARD OR GRADE STAKES • • •
Use this rail as guide for raising next rail
You are raising to this line
Jack
Direction of raising operation
For sighting, foreman should be 1½ to 2½ rail lengths from jack

LEARNING how to spot track is one of the first steps for the beginner. Raising track by eye alone without grade stakes or spot board comes next.

The best time to start a new man out raising track is when you are jointing up. It is comparatively easy to show him how to bring the joint up level and then give it another notch or two on the jack to allow for settling after it has been tamped and a train has passed over it. When he has mastered this he should be shown how to raise a full rail length or more. This will require more careful sighting and judgment, and he should be taught to sight the under edge of the ball of the rail. The critical point here is to get just the right amount of over-raise so that after it has been tamped it will settle under traffic to perfect surface. This is something that requires practice and varies with the type of ballast being worked in and the kind of tamping that is being done.

The next step is to learn how to spot track and at the same time maintain perfect cross-level. This is the most difficult of all track-raising techniques and the most essential. Track that is not maintained in perfect level will never ride satisfactorily at high speeds and will soon get out of line. In attempting to spot track and maintain cross level, too many track raisers get bogged down and find themselves doing a surfacing job, that is, raising the track out of face. To avoid this, you first send the level board ahead and find out which rail is running high or where the high spots are. You then use this as the sighting rail, raising from high spot to high spot and allowing just enough extra raise for proper settlement.

You do not raise the high spots, but match into them and skip any track that is level and appears to be in good surface. When one side is raised by eye the other side must be brought to level, and here great care will need to be exercised. Where the opposite rail has been freshly raised you will want to bring the track to exact level so that, after being tamped, both rails will settle the same amount and remain level. A little farther ahead where the opposite rail was already high and not raised, you will have to allow about ¼ in extra on your level board to allow for settlement of the fresh tamping under traffic. A complication arises when one side has been raised, assuming it has been tamped, and a train passes over it before the opposite side can be brought to level. Should this happen you will have to allow a little extra on the level board for settlement, since the side tamped first has already taken its initial settlement.

Allowing for Settlement

After trains have passed over some of your work, go back over it with the level board and with your eye to see what mistakes or errors in judgment you may have made. After doing this a few times you will be able to judge precisely the allowances that must be made for this type of raising in the kind

The Why of These Articles

We present on these pages the first of a series of three articles on how to surface track. In a sense, the series is a sequel to the three articles on "The Art of Track Lining," also written by Leo Blanchard, which appeared last summer, beginning with our May issue. These earlier articles stimulated a wide reader response, indicating there is a demand for authentic information of a practical nature on how to perform the basic track-maintenance operations. Hence, this further series on track surfacing. We are certain you will find it of equal interest and value as the material on track lining.—Editor

RAISING TRACK by eye means watching the rail ahead of the raisers to determine where high and low spots exist in the old surface.

of ballast you are working with. Another thing you must take into consideration is the expertness of the tampers you are working with. If they are well trained shovel tampers, less allowance will need to be made for settlement than if the tampers are untrained. Machine tamping is generally superior to shovel tamping and you will need to judge your raises accordingly.

Raising Without Stakes

The next step in the education of a track raiser is that of raising track out of face without grade stakes. Occasionally you will find a man who can run an almost perfect surface, holding it within proper tamping limits, without the aid of any special sighting devices such as a spot board. This fellow is in the same class with the expert track liner who depends on his eyes only. Incidentally, he uses almost exactly the same technique in running a true surface as is employed by the track liner in running a true line. He uses the projection method. By this I mean that, as each rail is raised, he uses the raised rail as the guide for raising the next rail ahead, projecting it straight away from the last raised rail. In attempting to do this many men have trouble in that, after raising a few rail lengths, tie rail begins to climb or get too high for the tampers. Others have trouble in having the rail drop and run down, so there is not enough raise for the tampers.

To correct this trouble, you should first of all have your eyes examined by a competent oculist or optometrist to make sure there is no defect present. If by chance there is, have corrective glasses made. Should this be necessary, check with the safety department on your railroad, which may be able to provide you with safety glasses with hardened lenses at very low cost. Many persons suffer from a slight defect in their eyesight without realizing it until called on to line or surface track where the best possible eyesight is needed. Just as in lining, a darkened pair of glasses should be worn, not only to minimize sun glare, but also to protect against flying dust and gravel. For lining I recommend smoked glass, but for raising I recommend amber. The reason for this is that, whereas the liner looks down on top of the mirror surface of the rail, the raiser looks along the underside of the ball of the rail where it is darker. There are of course other colors and there is no harm in experimenting until you find the one that suits you best.

How Far from the Jack

In order to carry a true surface for an indefinite distance by eye alone, it is first necessary to be the right distance from the jack. I like to be from 1½ to 2 rail lengths from the jack. I would not recommend being closer than 1½ or more than 2½ rails from the jack. You need to be close enough to see the bend in the rail clearly and you need to be far enough to project the rail accurately from the last raised rail. I recommend that you experiment within these limits. Next you must watch the rail ahead of the raisers to determine where high and low spots exist in the old surface so that you can make allowances to correct them. Some places will need an extra inch of lift and others will need to be raised less than your average lift. To keep your lift running uniformly, neither too high or too low, watch the bend in the rail where the raise is being made, in addition to projecting it straight away from the last raised rail. Between the two, and with sufficient practice, you should be able to carry an accurate raise.

On some lengths and weights of rail you can raise at the joints and centers without the quarters sagging, but on some rails, such as a 90-lb 39-ft rail, it is best to make three lifts per rail length. In other words, making a raise each 13 ft. Look out for bent rails or quarters that sag. You cannot project a straight rail from a bent rail or sagged rail, and this is where many raisers go wrong. In such cases pull the jacks back and make the necessary correction. If the rail is bent and you cannot correct it, make two or three lifts and, before the track is tamped beyond the bent rail, walk up ahead of the jack and sight back as a check on whether you guessed right. You just cannot be too careful.

Once you have mastered the technique of spotting track to good cross-level and, second, raising track out of face by eye alone, believe me, you are a track raiser of the first order. Anything that comes after this will seem easy. Why? Well simply because you now have a basic understanding of what it takes to produce track that is in good surface and good level.

Under the press of circumstances many track raisers get their first start in track raising by starting out immediately raising to grade stakes with a spot board. These men are in the same position as the track liner who starts out with an optical instrument lining to center stakes. They get along fairly well so long as the work continues in that phase, but let something go wrong or some change in the work take place and they are lost. That is why it is so important that a track raiser be well grounded in fundamentals as outlined in this article.

[Part II of this series will appear in the January issue. It will describe the procedure to follow in raising track with a spot board and sighting blocks, and will discuss the raising of track to grade stakes.—Editor]

Effects Savings by . . .

Mechanizing Bridge-Tie Renewals

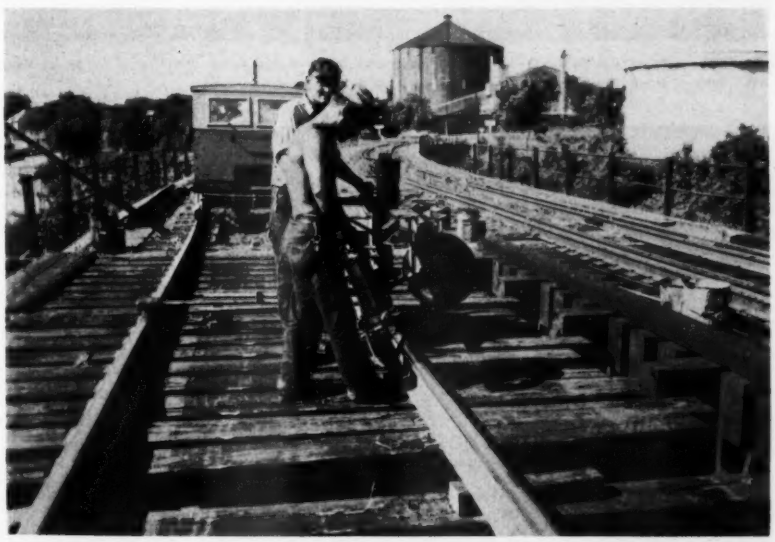
By adapting a machine usually employed for the renewal of crossties to the specialized job of bridge-deck replacement on a long double-track bridge, along with two other smaller units of equipment, the Northern Pacific shortened the time that would normally have been required to complete this work, with a resulting substantial saving in the cost of doing the work.

● The addition of several power units, notably a tie-renewal machine but also including a hydraulic spike puller and a pneumatic chipping hammer, had a marked effect in boosting the production of an eight-man gang when it recently renewed the timber deck on two open-deck spans in a bridge at the Twin Cities. In fact it is estimated that the overall output of the gang was thereby increased about 33 per cent, while the production when renewing ties jumped about 43 per cent as compared with previous experience.

Bridge No. 9 of the Northern Pacific is a double-track deck bridge 952 ft long. It is located on the road's "A" line between St. Paul and Minneapolis. This line is operated in freight service only and carries traffic of the owner railroad as well as of the Minneapolis & St. Louis and the Chicago Great Western between these cities. The bridge consists of an 80-ft and an 85-ft ballast-deck approach span at the east end; two 247-ft deck-truss spans, with open decks, over the river; and three 90-ft ballast-deck plate-girder approach spans at the west end. The latter approach spans are constructed on a curve.

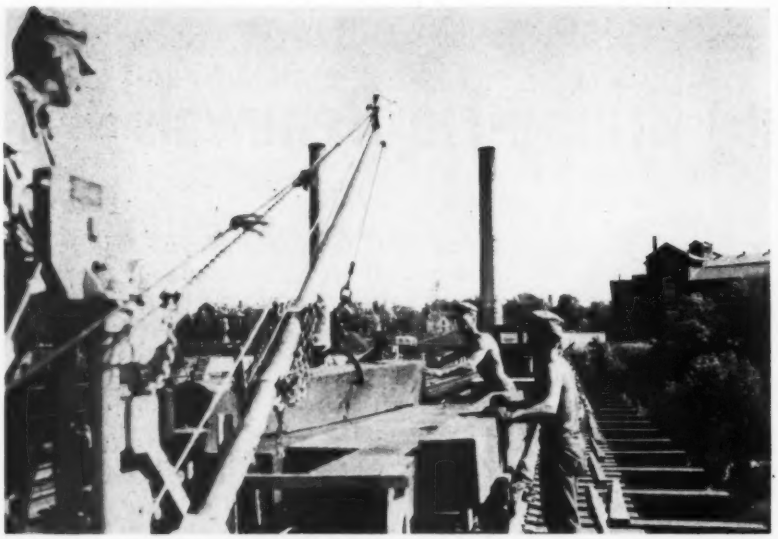
The untreated ties and other timber members of the open decks on both tracks of the river spans were renewed because they had deteriorated to the point were spot repairs were no longer economical. The new decks consist of 782 ties 10 in wide by 12 in to 14 in in depth and 12 ft long, except that every fourth tie is 16 ft long to provide supports for walkways between and outside the tracks, which were also renewed. The outside walkways are each protected by a pipe handrail which was removed from the old deck and reinstalled on the new deck. The inside guardrails are of 100-lb scrap rail and replace lighter guardrails which were in place on the old deck.

All of the new timber deck material was creosoted and preframed in the Northern Pacific's treating plant at Brainard, Minn. The ties and guard timbers were prebored for the hook bolts and guardrail bolts. Provision was made for the installation of 4-in No. 2 Teco split-



1 **PULLING SPIKES** from group of five ties with Nordberg hydraulic spike puller preparatory to removal by a . . .

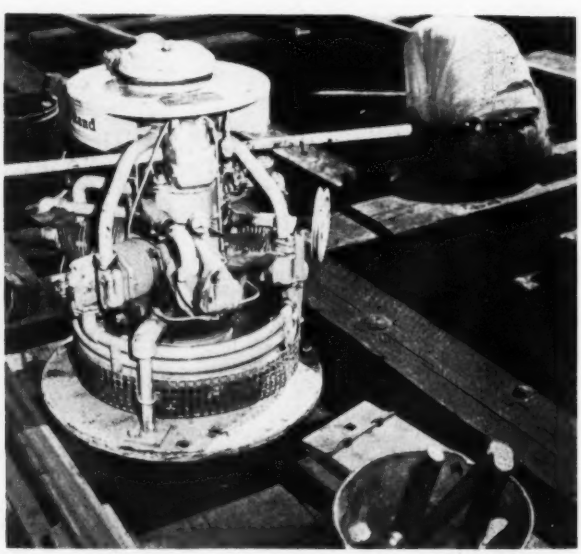
2 **NORDBERG "GANDY"** equipped with the tie tongs, which pulls ties laterally from their original position between stringers and rails.



3 TIES ARE LOADED by Gandy on a push car located on same track and later hauled away from the site for disposal.

4 LOOSE MATERIAL, chipped by hand from stringer tops, is swept away.

5 TOP SURFACES of stringer flanges are chipped clean with pneumatic weld flux scaling tool.



6 INGERSOLL-RAND "Spot-Air" supplies air to scaling tools and impact wrenches.

ring connectors at the location of each bolt in the timber guardrails. The timber guards and ties were field bored at locations where boat spikes were installed for the spacing of intermediate ties.

Work Under Traffic

The work of renewing the deck was carried out entirely under traffic using a crew of eight men and a bridge foreman. Because train movements over the bridge are relatively slow, set flags were used to protect the work and workmen. The tracks were available for work about six hours a day.

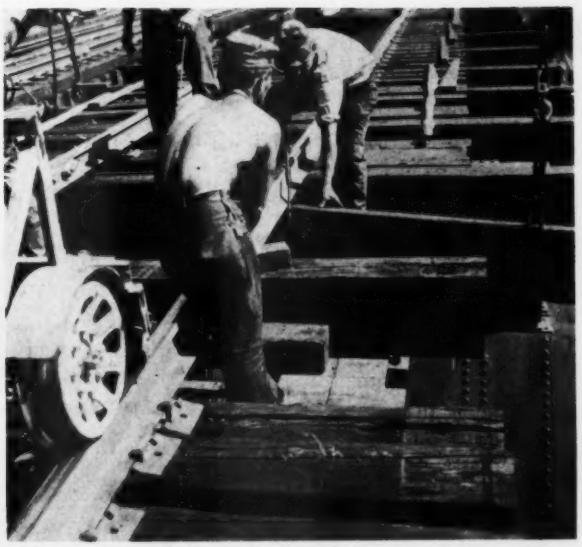
Since there was no place available for the storage of bridge material at the immediate site, it was unloaded about a mile east of the bridge and moved to the work by two Fairmont A-5 motor cars each hauling a heavy-duty push car. A Nordberg "Gandy" was used to load and unload the push cars.

One track was redecked at a time, the work progressing from east to west. The inside guardrails, the handrails, and the walk and guard timbers were first removed with the aid of the Gandy for handling all of the heavy material. A Nordberg hydraulic spike puller was then used to pull the spikes in a group of five ties, and the rails over these ties were jacked up approximately 4 in and blocked on a single tie. The tie plates were removed and stacked on a floorbeam.

The Gandy was used to pull the loosened ties laterally from the space between the rails and the stringers and to load them on a push car placed on the track east of the crane. The top flanges of the stringers were then swept clean and the light scale was removed with a hand chipping hammer. Next, the top surfaces of the stringers were chipped clean with a No. 18 pneumatic weld flux scaling tool operated from an Ingersoll-Rand "Spot-Air" compressor.

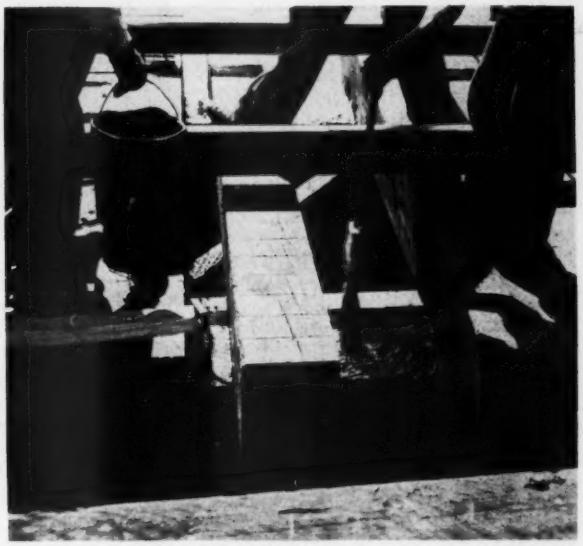
The new ties were next placed on the stringers with the assistance

7 GANDY PICKS UP new tie from push car spotted west of the work. Tie is swung into position and . . .



8 ONE END OF TIE is inserted between outside rail and stringer in position so that it can be . . .

9 PULLED INTO POSITION, spotted laterally but bunched longitudinally with other ties on stringers until . . .



10 BRIDGE CEMENT is spread; then ties are spaced, rails are lowered to position and spiked in place.

of the Gandy which lifted them from a push car spotted west of the work. After one end of the tie had been landed on the outside stringer under the rail, two men threaded it through the space between the rails and stringers and spotted it laterally. The new ties were temporarily bunched longitudinally to permit application of a bridge cement to the tops of the stringers to prevent corrosion of the metal. The material used was No. 9 Laurel bridge cement, an asphaltic-base product. It was poured on the stringer tops and spread with a broom.

The ties were then spaced, the plates were applied on a seal coat of the bridge cement, and the rail was lowered and hand spiked to position. Hook bolts were installed in every third tie and tightened with an impact wrench. Temporary boards were nailed to the tops of the ties at their ends to maintain the proper spacing until the timber guards could be installed, which work was done after all of the ties on one track had been replaced.

Use of Gandy Speeds Work

It was originally estimated, based on previous experience on similar work and employing a gang of equal size using the equipment then available, which included a hand-operated derrick for handling the ties and timbers, that it would require about 80 days to complete the work. Actually the job was finished in only about 60 working days. During this period, exclusive of the time spent in overall preparatory and finishing work, the gang installed an average of 20 ties per day. It was stated that, without the use of the Gandy, the average would have been 14 per day.

The project was carried out under the general direction of W. R. Bjorklund, district engineer, and under the direct supervision of C. W. Coil, division superintendent, and A. B. Riley, supervisor of bridges and building.

What About the Hickory Crosstie?

Information brought out at convention of Railway Tie Association developed the following points:

(1) Use of hickory for all purposes has declined.

(2) The result is problem in forest management.

(3) Use of more hickory crossties would help, but

(4) They check and split during seasoning, so

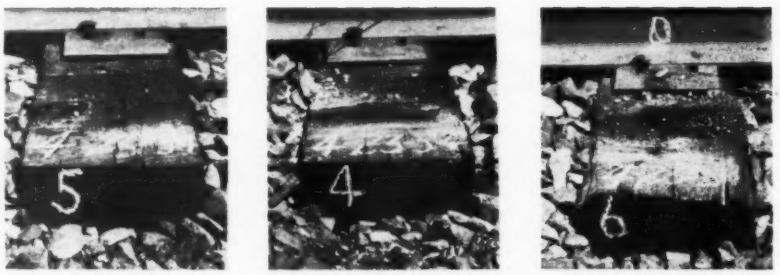
(5) Tests were made with various seasoning methods, showing

(6) That objectionable characteristics can be overcome.

●The hickory crosstie is not very popular on many railroads, and apparently for good reasons. During air seasoning such ties are highly susceptible to checking and splitting, decay and insect damage. On the other hand, hickory has qualities of strength and resistance to wear which would make it more attractive as a crosstie if the objectionable characteristics could be removed or minimized. Steps in this direction are now being taken.

These facts came out in a discussion of the use of hickory for crossties during the recent annual convention of the Railway Tie Association, which was held at the Mayflower Hotel, Washington, D. C., October 20-22. Most of the material on the hickory problem was presented in an address by M. S. Hudson, research chemist, Taylor-Colquitt Company, Spartanburg, S. C.

It seems, according to Mr. Hudson, that various circumstances have brought about a sharp decline in the use of hickory for many purposes, such as structural parts of vehicles, as handles for hand tools (now supplanted by mechanized equipment), and many other uses.



HICKORY TIES, in tracks of Atlanta & West Point, were incised and Controlled Air Seasoned before being treated. Other methods being tested are straight air seasoning, incising prior to air seasoning, and Vapor-Drying (see opposite page).

Nature of the Problem

At the height of its use about 1910, the amount of hickory used annually was nearly 400 million board-feet. Today, according to Mr. Hudson, the annual consumption is in the neighborhood of 100 million board-feet, including that used for fuel. This decline has created a problem in forest management.

The problem thus created is now under study by a group of men representing the national and state forest services, the forestry departments of several universities, a number of railroads, and various industrial groups.

In considering ways by which the use of hickory might be increased, it soon became apparent, declared Mr. Hudson, that much of the hickory being cut is going into crossties, and that, because the requirements for making a crosstie are much less exacting than those for such products as tool handles and skis, the largest chance for increase in use would probably lie in the railroad field. It was brought out that the percentage of hickory used by the railroads is very low "in spite of that fact that the strength properties possessed by hickory, that should make it suitable for use as crossties, are far above those of most species used for this purpose."

Mr. Hudson related that he had been appointed to head up a subgroup assigned to develop information on the preservation of hickory crossties. The first step taken by this subgroup was to make a survey of the use of hickory by the railroads. This was done by means of a questionnaire sent to the chief engineers of roads whose crossties are produced in the hickory growing area.

Answers to the questionnaires were received from 39 roads, of which 9 use hickory ties and 30 do not. Of the latter roads 23 said that hickory is ruled out because of excessive checking and splitting in seasoning, and 12 avoid its use because of susceptibility to decay and insect damage during seasoning. (Answers to these questions total more than 30 since objections on more than one were expressed by some correspondents.) Twenty of the railroads that do not now use hickory said that hickory would be acceptable to them as a crosstie timber if defects developing during seasoning could be overcome.

Nine of the railroads replying to the questionnaire accept hickory for crosstie purposes, ranging from a maximum of 5 per cent of their tie purchases on the part of one road to no set limit on the part of others. The number of ties used by these nine roads in 1952 was slightly over 5 million. Mr. Hudson reasoned that, if these hickory users average 20 per cent of their purchases as hickory, "which is not unreasonable, then 1 million hickory ties, or about 45 million board-feet, were used during that year. This is nearly half the present average annual cut of hickory," he said.

Thus assured "that a program leading toward elimination of these objectionable features of hickory would be met with greater acceptance of the species for crossties if it were successful," the wood-preservation group decided to set up four tests utilizing the latest devel-

TOTAL of 718 hickory ties were Vapor-Dried. Here is typical group of these ties before treatment (above) and after treatment (below).

opments in tie seasoning for hickory. The tests involved the following methods:

(1) Straight air seasoning, employing new methods of stacking;

(2) Incising prior to air seasoning;

(3) Incising and Controlled Air Seasoning*; and

(4) Vapor-Drying†

Straight Air Seasoning

Information on the results of most of the tests were submitted to Mr. Hudson by other members of his group and incorporated in his address. The report on air seasoning was submitted by C. J. Plastre, chief tie and lumber supervisor, Atlantic Coast Line. In this test, 93 ties were seasoned in open stacks, using the 1 x 9 stacking method, for periods of 3 and 6 months. A considerable percentage of these ties developed end splits and the "results of treatment . . . with respect to per cent of sap wood penetrated were not as good as normally obtained in hickory ties air seasoned for 12 months."

Effect of Incising

The results of tests on the incising of hickory prior to air seasoning were presented in a separate paper at the convention by F. S. Shinn, tie and timber agent, Nickel Plate. These tests involved two carloads aggregating 627 ties. When the ties were received two 5-in C irons were applied in each end of each tie, which is standard practice on the Nickel Plate with all ties 7 in. thick. Approximately 50 per cent of the ties were incised, after which both the incised and non-incised ties were stacked for seasoning adjacent to each other for comparison.

Mr. Shinn stated that an inspection of the ties during the last week in September, when the test was of nine months duration, showed that a large percentage of the non-incised ties were badly checked and split, whereas "there is less checking in the incised ones than normally occurs in non-incised red oak." Mr. Shinn is of the opinion that these ties "will not show any more tendency to check and split after they are in the track than a seasoned oak tie will, and it is well known that they are the strongest ties of all the commercially available species and will resist plate cutting better than other species."

Incising; Controlled Seasoning

The report on the test made with ties incised and controlled air seasoned was made by J. A. Vaughn, director of research, Southern Wood Preserving Company. This test involved a total of 509 ties which were subjected to controlled air seasoning for 11 days. They had previously been air seasoned about 30 days. Of the 509 ties 39 were judged as being subject to rejection because of splits that developed during the air-seasoning period prior to controlled air seasoning, or because of a "stump-shot" condition. After controlled air seasoning, adzing and boring, it was judged by the railroad inspector that 384 of the ties were satisfactory, 85 were satisfactory if doweled, and 40 were culls on account of splitting. These ties were treated with an 80-20 creosote-petroleum solution, during which they were given a net retention of 6.02 lb of preservative per cubic foot. Borings showed that the average penetration of the preservative was 1.3 in. The ties that were accepted in this group were installed in track on the Atlanta & West Point at East Point, Ga.

Results With Vapor-Drying

The results of a test involving the Vapor-Drying of hickory ties were contributed by M. W. Deichman, wood technologist, Taylor-Colquitt Company. In this test 718 ties were subjected to the Vapor-Drying process. The net retention of 80-20 preservative was 8.97 lb per cubic foot, and borings showed an average depth of penetration of 2.2 in. The railroad's inspector judged that 577 of the ties were satisfactory after treatment and the remainder were satisfactory after doweling one or both ends. All of these ties were installed in the tracks of the Charleston & Western Carolina between Moore, S. C., and Roebuck.

In his concluding remarks, Mr. Hudson said that these tests show sufficient promise that purchasers of ties "should feel it almost obligatory to reopen the question of use of hickory in their operations."

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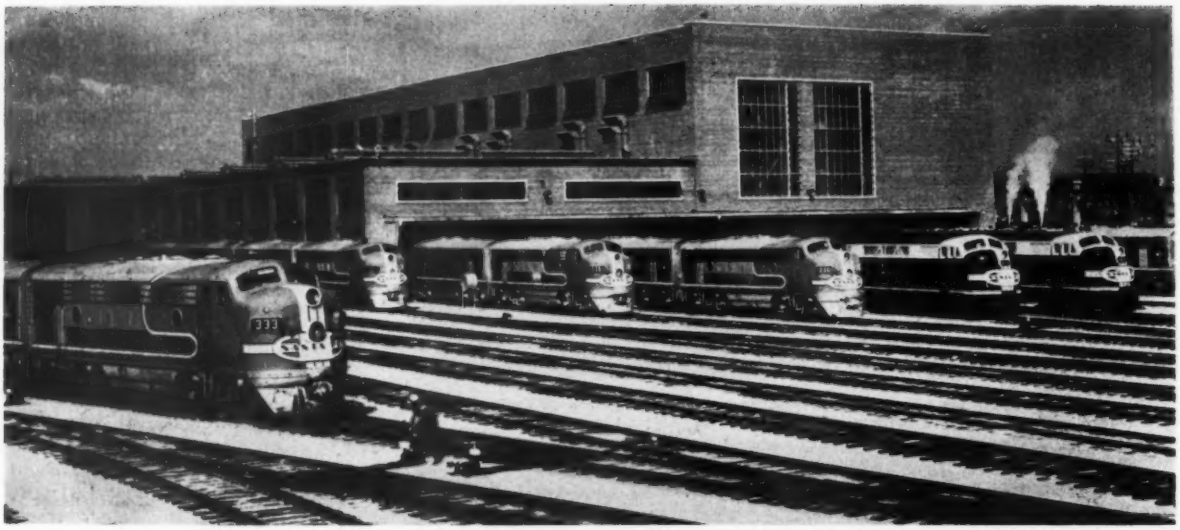
* Controlled Air Seasoning is a method of air seasoning under controlled conditions of temperature and air flow within housed units. It is a development of the Southern Wood Preserving Company, Atlanta, Ga.

† Vapor-Drying is a method of artificially seasoning wood products, in which the wood is exposed in a closed vessel to the heat of vapors produced by boiling suitable organic liquids at atmospheric or sub-atmospheric pressures. This process is a development of the Taylor-Colquitt Company.

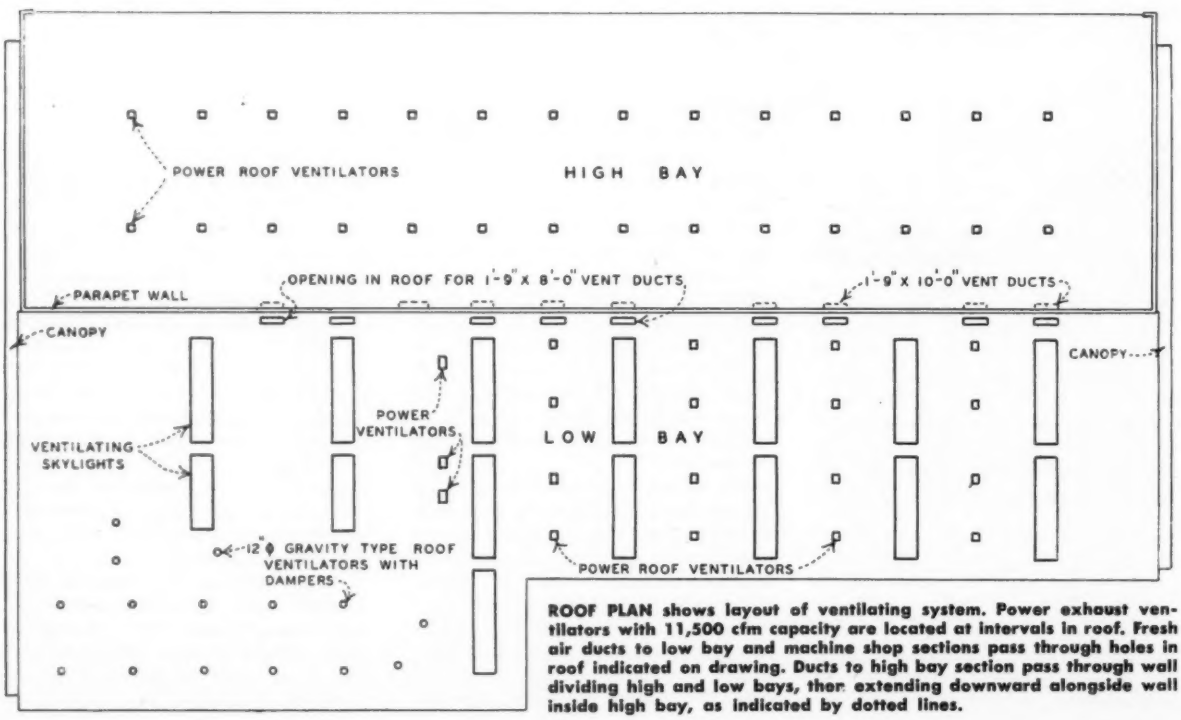


SHOP BUILDING is one of largest and best equipped of its type yet built. At right is heavy repair section with running repair portion located at left.

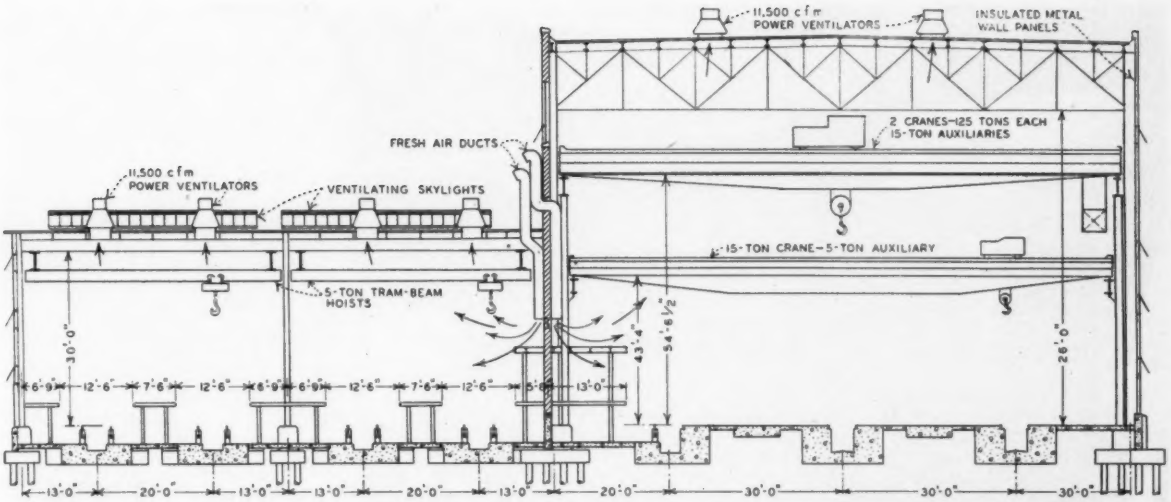
Santa Fe's new diesel shop at Kansas City is equipped with system incorporating fresh-air ducts with outlets at top-of-locomotive level along sidewalls. Exhaust fans in roof bring fresh air in under rising diesel exhaust fumes and pull fumes out through roof, preventing them from penetrating to working level below. Radiant heating system in the concrete floor heats the working area.

For Large Diesel Facility . . .

New Concept in Shop Ventilation



ROOF PLAN shows layout of ventilating system. Power exhaust ventilators with 11,500 cfm capacity are located at intervals in roof. Fresh air ducts to low bay and machine shop sections pass through holes in roof indicated on drawing. Ducts to high bay section pass through wall dividing high and low bays, then extending downward alongside wall inside high bay, as indicated by dotted lines.



VENTILATING system in shop sections employs fresh air outlets along sidewall at about top-of-locomotive level. Fresh air is drawn in under rising diesel exhausts and the fumes sucked out through roof by power ventilators.

● The thorny problem of heating vs. ventilating in diesel shops—how to combine and balance the two during cold weather so that employees in the shop area can work in reasonable comfort—has been tackled in an unusual way in a new shop the Santa Fe has built at Argentine (Kansas City), Kan.

The new shop building, reportedly one of the largest and best equipped diesel facilities yet to be built, handles maintenance, form inspection, servicing and some heavy repair work on 383 diesel locomotive units. The building proper is 260-ft by 400-ft in plan and consists of three principal sections: A high bay extending the full length of the north side of the structure; a low bay situated alongside the high bay and extending about half the length of the building; and a 2-story portion comprising offices, storerooms, a machine shop, a parts cleaning room and wash and locker rooms.

The Ventilating Theory

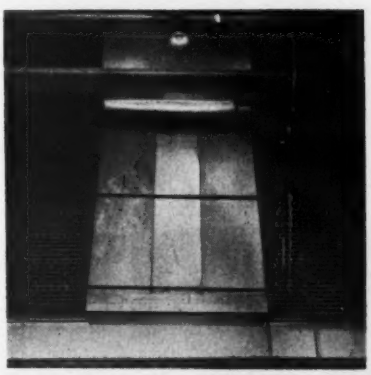
A ventilating system has been installed in both the high and low-bay sections, which involves a comparatively new concept centered around the establishment of a restricted "zone" of air circulation. Basis of this concept is the fact that diesel fumes rise while warm, but on cooling have a tendency to settle. In designing the Argentine shop, a means was sought whereby diesel fumes could be carried out of the shop area before becoming sufficiently cool to settle into the working level. Overhead crane installations in both the low and high bays precluded the use of hoods over the tracks.

A system employing exhaust fans in the roof drawing fresh air from the floor level up was not considered desirable for winter operation since satisfactory heating of the working level with such an arrangement would be difficult, if not impossible. It was felt though, that if the air circulation could be restricted to a zone above the working level, the heating of the lower portion could be accomplished more easily.

Accordingly, a system was developed which brings in fresh air along the side walls of the shop area at about the level of the top of a locomotive unit. Exhaust fans in the roof draw this fresh air in under the diesel exhausts. The fresh air is then pulled upwards through the roof, carrying the diesel fumes with it. Air circulation theoretically does not penetrate to any great extent below the top-of-locomotive level, and the incoming supply of fresh air forms, in effect, a protective layer between the diesel fumes and the working level.

The fresh-air ducts are of metal and are 1 ft 9 in by 8 ft in cross section. They are installed with outlets at intervals along both sides of the wall dividing the high and low bays. Nine ducts serve the high bay, and seven the low bay. There are also two ducts feeding into the parts cleaning and machine shop areas.

In the roof of the high bay there are 28 Ilg power exhaust ventilators, with a capacity of 11,500 cfm each. The roof of the low bay has 16 units of the same type. In addition there are three fans which exhaust air from the parts cleaning and machine-shop sections.



FRESH AIR ducts have dampers at outlets controlled by chain mechanisms.

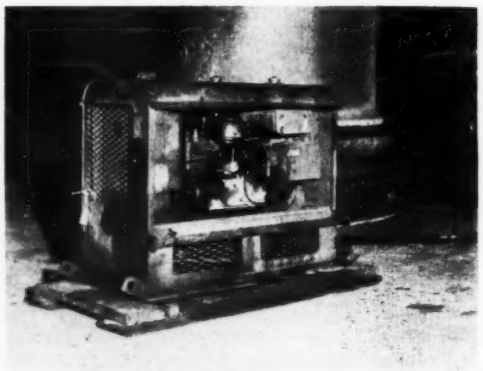
Radiant Heating in Shop Area

Heating in the shop sections is provided by a radiant system consisting of Byers wrought iron pipe, embedded in the concrete floors. Warm water circulated through the tubing is maintained at a constant temperature, usually around body temperature. The rate of circulation is varied by thermostatic control, increasing or decreasing as the outside temperature goes down or up. The radiant system causes a continuous supply of warm air to rise from the concrete floors, thereby maintaining the entire working area at a comfortable temperature. Water for the system is heated by steam which, along with other steam requirements in the shop, is supplied from a central power plant serving all of the Argentine facilities.

BAGGAGE ROOM in upper basement level of Chicago Union Station was inundated by rampaging Chicago River waters which cascaded down ramps from tracks above. Sub-basement below, containing station's power plant, was completely submerged.

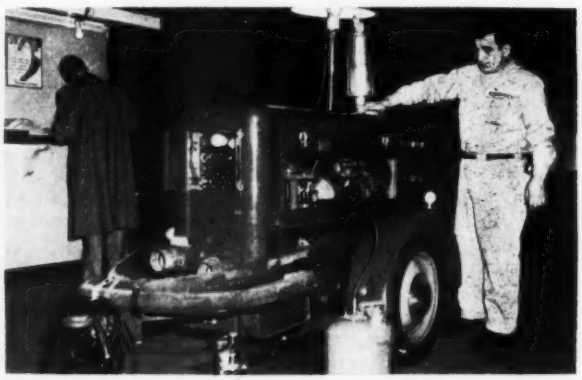
When Flood Knocks Out Power . . .

KOHLER electric plant on baggage truck in north concourse supplied power for lighting concourse.



ONAN Model W3M unit at Canal Street entrance fed lines to PRR offices on upper floor.

CATERPILLAR D310 Diesel-electric Set powered Milwaukee communications room on 8th floor.



S&G TRAILER unit, a combination generator, water pump and air compressor, supplied part of waiting-room lighting.

● At 6:15 p.m. on the evening of October 10 things at Chicago's Union Station were just about normal for a late Sunday afternoon. Just 50 minutes later the station's power plant located in the building's sub-basement was submerged in 21 ft of water, plunging the building into darkness and completely paralyzing station operations. At the same time the swollen Chicago river, which had broken through a concrete retaining wall separating it from the station facilities, flooded station tracks to a depth of 3 ft, cutting off all train operations. Elevators serving the operating department offices of the Pennsylvania and Milwaukee, located on the upper floors of the building, were likewise put out of commission.

Water from the river, 5 ft above normal because of the heaviest rains in any 24-hr period in Chicago's history, cascaded down baggage platform ramps to the station's lower levels, eventually inundating the sub-basement and filling the upper basement to a level of about 23 in.

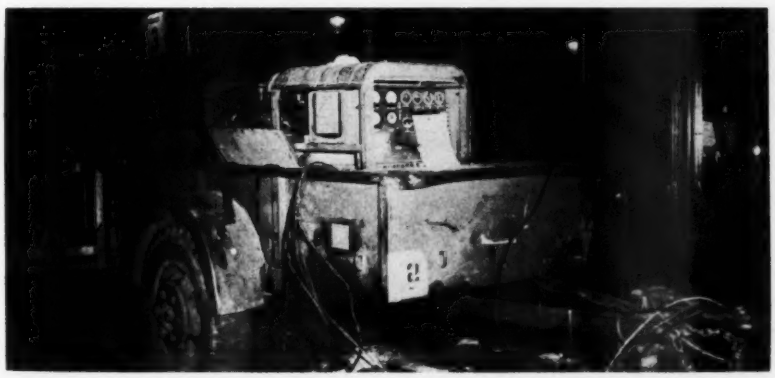
The following day the river receded, leaving station tracks and the basements under a lake of water. The Chicago Fire Department, assisted by pumper boats on the river and numerous smaller pieces of equipment, began the tremendous job of pumping the water back into the river. In the meantime portable generating equipment, air compressors, steam generators, etc., were obtained from various industries, building contractors and civil defense agencies in an effort to restore as much of the station operations as possible.

All of the electrical equipment in the station's power plant had to be removed and sent to electrical shops for cleaning and drying out. Since all of this equipment would be out of service for quite some time, Commonwealth Edison Company, Chicago's supplier of electric power, installed a temporary substation on the upper basement level to which power was furnished by a special line. However, since it was three days before this installation was completed, it was necessary in the interim to rely almost entirely on portable plants for electrical power.

Pumps which normally supply domestic water to roof tanks for sanitary water service above the second floor were also knocked out. To handle this emergency, portable pumping equipment was set up on the street below and fire hoses were run up the side of the station building to the roof tanks. Since inundation of the power plant meant that the supply of compressed air for operating the station's sewage ejectors was cut off, portable air compressors were brought in to supply air for this purpose.

By October 15 the station was again functioning in a nearly normal manner, on the surface at least; however, it was expected that it would be about December 1 before all operations were again back on a permanent pre-flood basis.

. . . Portable Equipment Takes Over



O'KEEFE & MERRITT trailer-mounted power plant parked in north concourse furnished power for some of north end facilities.

LE ROI unit in south taxi loading area helped light trainshed.

CLAYTON steam cleaner was used for sterilizing contaminated restaurant equipment and for miscellaneous cleaning tasks.

GARDNER-DENVER compressor furnished air for operating station's sewage ejector system during emergency.

House Trailers for M/W Gangs

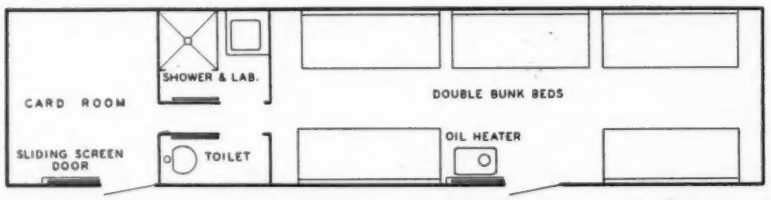
● Reflecting increasing interest on the part of railroads in the use of highway trailers for housing maintenance-of-way employees, a number of trailer manufacturers are indicating a desire to furnish units designed to meet the raliroads' needs. Among these companies is the International Trailer Company, Inc., Baltimore, Md., which has announced its willingness to produce custom-built heavy-duty trailers of a basic design which can be varied in size and arrangement to conform to requirements encountered on the railroads.

Chassis of the basic unit is constructed with 6-in channel-steel longitudinal members and 4-in channel-steel cross members, supporting a floor structure of wood members covered underneath with ½-in Homosote board and on top with a ¾-in plywood sub-floor. The floor construction, combined with single or tandem, Warner electric-brake axles, permits elimination of wheel wells, thereby increasing useable floor space.

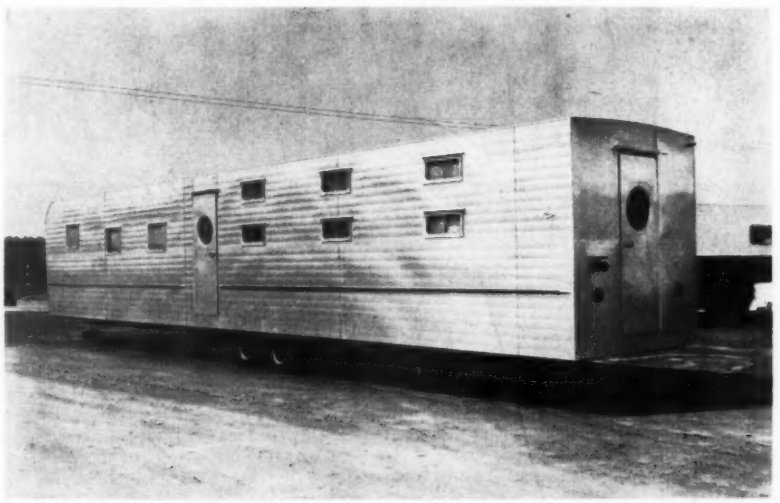
The body shell has a framework of 2-in by 10-in, 2-in by 4-in and 2-in by 2-in air-dried fir. Sidewalls are covered with aluminum, while the roof is of 24-gauge galvanized steel over ¾-in exterior plywood. The roof is caulked, tape-sealed and finished with extruded aluminum moulding. Fibre glass insulation is used throughout. Fenestration is supplied by both fixed and projected-type aluminum windows.

The trailer interior is lined with ¼-in birch plywood. Overhead lighting is supplied by fluorescent fixtures. A space heater delivers warm air through ducts in the floor.

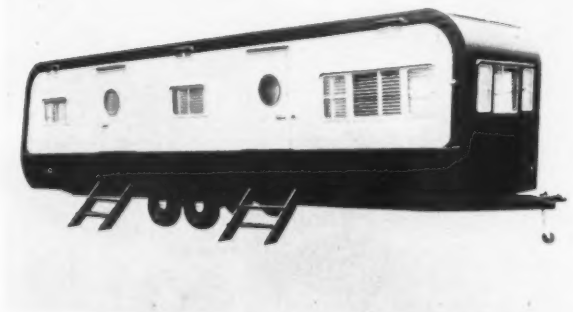
FOURTEEN-MAN kitchen-diner. Kitchen equipment for International's trailers can be of either house or institutional type depending on number of men.



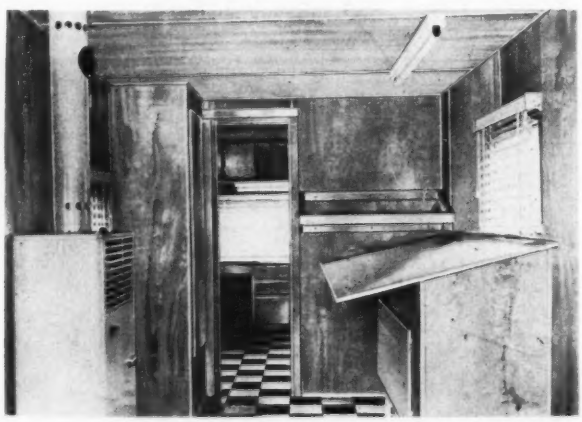
TEN-MAN bunk. Built-in wooden bunks, two high, or Navy-type chain bunks, three high, can be provided with either wood or metal storage lockers.



ALUMINUM sidewalls and galvanized steel top give strong weather-resistant exterior. Windows can be of either fixed or projected type.



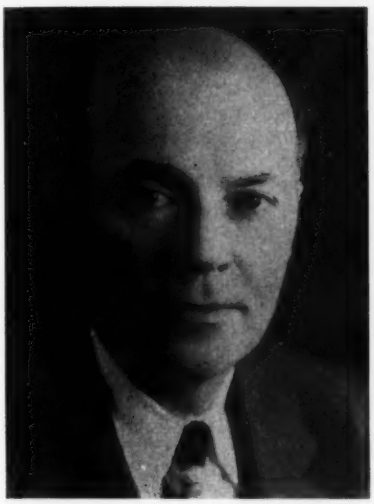
FIELD OFFICE Model F035D, 35-ft unit. Standard model also available in 23, 28 and 30-ft lengths.



PLYWOOD interior gives attractive appearance. Space-consuming wheel wells are eliminated by new underframe design.

Employee Relations . . .

Key to Sound Public Relations



By E. H. Hallmann
Director of Personnel
Illinois Central, Chicago

At one of the joint sessions of the concurrent conventions of the Roadmasters' Association and the American Railway Bridge & Building Associations at Chicago in September Mr. Hallmann spoke on the subject "Public Relations Depends on Employee Relations." At the outset of his remarks Mr. Hallmann said he considered that his audience consisted of "members of management in your respective companies" and that he intended to slant his remarks accordingly.

In the first part of his address he told how M/W supervisors could help the railroads to win "the unity, efficiency, and loyalty" of their employees. In the second part he discussed the "value of teamwork within our railroad organization in maintaining good public relations." These two parts are abstracted separately on these pages—Editor.

Needed in Making Most of "Greatest" Asset . . .

- More care in hiring employees
- More thorough training of new men
- More help for promising employees

● Just as a building or a bridge depends on its foundation for stability and strength, a railroad must depend on the unity, efficiency, and loyalty of its employees to win and hold public good will. Its employees are a railroad's greatest asset.

It is vital to the present and future welfare of the railroad industry that we make the most of this valuable asset. How can we do this? As I see it, we must do three things: First, we must be more selective in hiring new employees; second, we must do a thorough job of indoctrinating and training new employees; and third, we must identify the better-than-average employees in the ranks and help them achieve what their abilities promise.

Keeping Out Undesirables

The importance of careful hiring cannot be over-emphasized. If we are going to build strong railroads for the future, we must have high-quality personnel; we must do everything consistent to keep trouble-makers and incompetents out of our service. To do this, we must use every means available to us for checking on applicants. Of course, we should beware of permitting personal bias or prejudice to color our judgment, lest we do an innocent person great harm. We should not prejudge applicants on the basis of circumstances like the farmer did who had been called for jury duty. The lawyer asked the farmer: "Who influences you the most—the witnesses, the judge, or the lawyers?" The farmer replied: "I ain't influenced by anything said by the witnesses, the judge or the lawyers. I just look at the prisoner and say to myself, 'if he ain't done something, why is he here?' and I vote 'em all guilty."

Finding the Ideal Employee

It's no trouble at all for you or me to visualize the ideal employee, but unfortunately such persons are much easier to visualize than to find. Yet, they do exist, and in far greater numbers than one might imagine. We must set up employment procedures that will help identify applicants who give promise of meeting certain specifications. We must give more attention to interviewing, testing and screening applicants for employment if we want to be certain of having personnel who are a credit to our industry.

After hiring the right kind of people, our next responsibility is to help them get started in the right path. This will make for better morale and eliminate a lot of labor turnover, and all of you know that labor turnover is not only costly but it makes your job that much harder. Dr. Robert D. Loken of the University of Illinois completed a labor turnover study some time ago which disclosed that 75 per cent of the people covered in his investigation quit their jobs for reasons which the employers could well have done something about.

Keeping Them Informed

Students of human relations tell us that keeping employees informed on what they want to know about things relating directly to themselves is a "must" in maintaining good morale. It goes without saying that, first of all, every employee wants to be treated as an individual. What do employees want to know? Why, the same things you and I want to know, of course. They want a general knowl-

edge of their company—its background, its organization and its operation. They want to know what their company's policies are, especially new policies affecting them and their fellow workers. They want to be informed of company plans, about changes in methods and machinery, and the effect of these changes upon their jobs. They want an understanding of how their jobs fit into the overall operation. They want to know what the prospects are for steady work and what opportunities exist for advancement. They are interested in the railroad's income, profits and losses.

This hunger for information is perfectly natural. The average employee spends more of his waking hours on the job and with his fellow employees and supervisors than he does with his family, neighbors, union leaders, or any other group. His job means a lot to him. He wants all the information about it he can get. He wants to know the bad news as well as the good news. Management must either share information with the employee or the employee will fall back on the grapevine and accept biased rumors and hearsay.

Whose Responsibility?

Occasionally, a supervisor or a foreman takes the attitude that it is not his responsibility to communicate understanding to anyone—that his job is that of keeping work going on schedule. Such an idea is wrong. Communicating understanding and encouraging participation is the job of everyone who exercises supervision. This job of influencing attitudes cannot be accomplished by the president or a handful of specialists alone. It must be done by everyone from the president right on down through the organization to roadmaster, track supervisor, section foreman, and all others of us who represent management. We all know that a basic part of our job is to interpret our railroad to those for whom we have a responsibility. There is no need for me to tell you that this is one of your toughest assignments.

Help Them Get Ahead

Now we come to another "must" in building a healthy railroad organization. I have discussed the importance of hiring only high-quality people. Naturally, all of these people will not have the qualifications that will fit them for future supervisors and officers. But a certain number of them will have these qualifications, and it is up to all of us who are members of management to help identify these individuals and do what we can to help them achieve what their abilities promise.

You well know that, in order to make a good supervisor, a person needs to be much more than just a good worker or a pleasant fellow. He must have some creative imagination. He requires initiative. He has to be able to assume responsibility, rather than be a buck passer. He is going to make some mistakes, of course, but if he has good old-fashioned common sense, it will go a long way toward making up for a few mistakes. Good health is a must.

All other things being equal, we should pick the man with a good education, not because education puts any more brains into a person's head, but because it enables a man to use the brains he has more effectively. Of course, all well-educated men do not acquire their education in college or university—they may get it on their own. In seeking good supervisory material, we should never by-pass an individual simply because he can't produce a diploma. Furthermore, we should not be awed by high IQ's. A person of average intelligence who knows how to use his brains will accomplish far more in the long run than a man in the higher IQ brackets who doesn't.

. . . Plus Efforts of the Entire Team

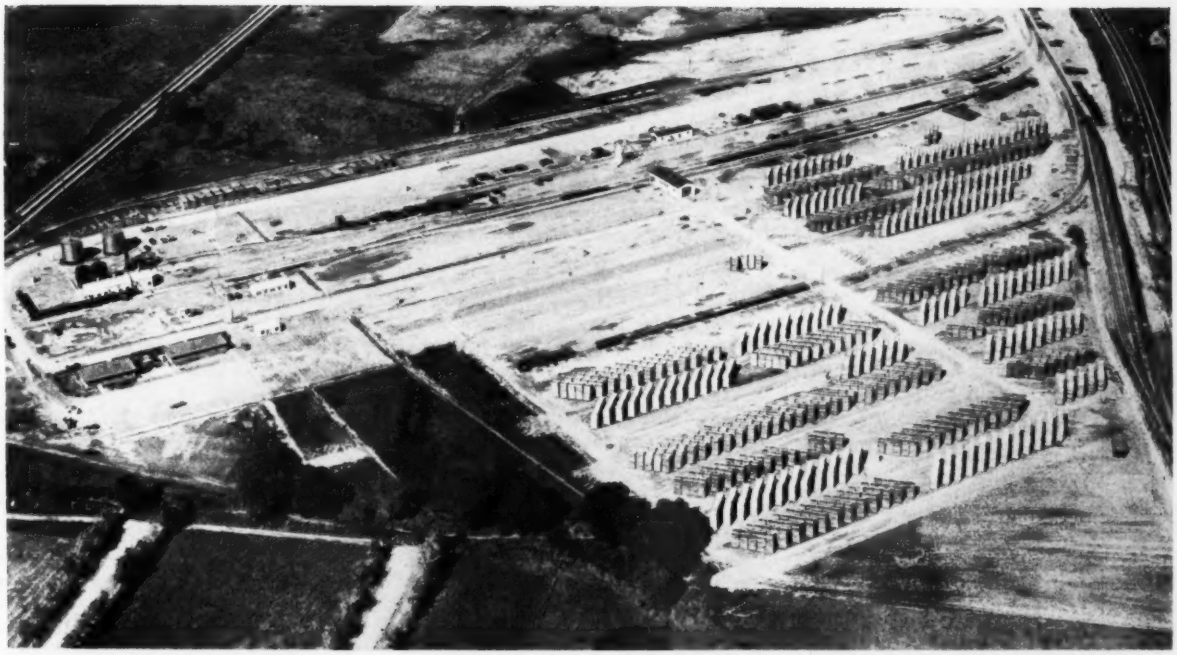
I should now like to discuss the value of teamwork within our railroad organization in maintaining good public relations. The value of teamwork was clearly demonstrated during the depression that started in the late 'twenties. Some of us still have a vivid recollection of those dismal years. Before that depression, it had never been customary for the vast majority of railroad workers to concern themselves about where or how their companies got business—they left that entirely in the hands of the executives at headquarters and the traffic people. But the depression taught all of us that when times get really tough, securing enough business to keep everybody's paycheck coming regularly requires the efforts of the entire team.

The same idea applies to maintaining public good will today. Public relations is not the work of a single person, or even a small handful of people. It is an effort which must have the attention and participation of everyone. Outsiders form their opinions of railroads by their contacts with first-line railroad representatives, such as traffic salesmen, conductors, ticket clerks, telephone operators, dining car stewards, waiters, agents, freight cashiers, receiving and delivery clerks, yardmasters, switchmen, and section foremen. There are other behind-the-scene workers, such as section laborers, clerks, and mechanical employees, who are also important. For example, an electrician whose mistake results in an air-conditioning failure can create as much ill will for his railroad as the conductor who offends a passenger.

In other words, a railroad employee, even though he may not be in direct contact with the public on the job, still can play a very important role off the job if in no other manner than in the way he conducts his normal life. This is just another way of saying that the public's reaction to the railroad industry can be enhanced or impaired by the citizeship displayed by each of us in everyday life.

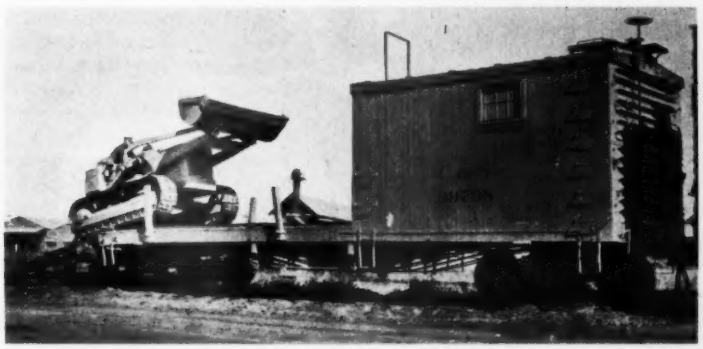
You may well be wondering how a section foreman, for instance, can fit into this picture. Our railroad recently celebrated its centennial Since that time, many of the villages and towns along our line have also become one-hundred years old. Invariably, our agent or section foreman is on the centennial committee.

To hold their place in the highly competitive field of transportation, the railroads of the future must be manned by alert and respected workmen—people who are proud of being railroads; people who know that theirs is a public service fundamental to national well-being. These alert men and women will be so interested in the progress of the railroad industry that they will speak up for it at every opportunity and share with management and the public alike the thoughts and ideas and observations they develop with respect to better railroading.

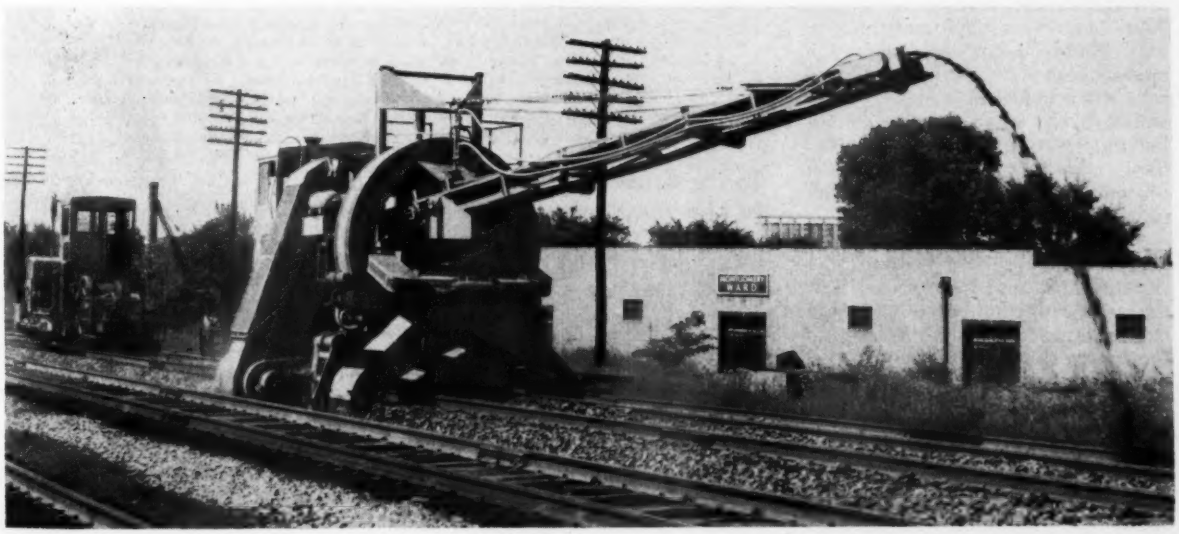


TIMBER-TREATING plant constructed recently by Koppers Company, Inc., at Horseheads, N.Y., to serve the Lackawanna and the Erie and other users of treated wood. Plant has pressure cylinder 8 ft in diameter and 132 ft long (far left.) Other features include tie boring and adzing mill, planing mill, automatic tie unloader, and other mechanized handling equipment.

News Briefs in Pictures . . .



CATERPILLAR D6 shovel owned by the Colorado & Southern has "private car" for use when being transported from one job site to another.



PULLMAN-STANDARD power ballast cleaner in operation on Erie. In background is winch car which pulls cleaner.

WHAT'S THE ANSWER?...

. . . a forum on track, bridge, building and water service problems

Water-Free Fuel Oil for Diesels

What effective methods may be established to assure the delivery of water-free fuel oil to diesel locomotives? Explain.

No Service Problem

By EARLE M. ENGER

Supervisor B&B, Chicago, St. Paul, Minneapolis & Omaha, St. Paul, Minn.

Since the advent of diesel power on the Omaha dating back to 1938, when diesels were introduced on the Chicago-Twin City "400" run, we have had, to my knowledge, only one incident of water in the diesel fuel emanating from this terminus. This was several years ago when the diesels died en route to Chicago and investigation developed that there was several hundred gallons of water in the locomotive diesel-fuel tanks.

An exhaustive investigation of all diesel-fuel storage tanks and diesel fuel in storage in railroad tank cars at this terminal at that time disclosed that there was no water in any of the storage tanks, with the exception of a trace at the bottom of a 10,000-gal underground tank. When this tank was cleaned it was found that there was less than a barrel of water in the tank and that this was more than four inches below the suction line of the pump. The only reasonable conclusion that could be reached for the amount of water present in the diesels, when none was present in the storage tanks, was that an error had been made in servicing the locomotives and that water had been placed in the fuel tanks at the time of servicing.

Since that time, we have made monthly checks of all diesel-fuel storage tanks and have found that the water accumulation in these storage tanks is negligible. This may be due to the fact that we do our unloading from tank cars with top unloaders which do not readily pick up any small amount of water that may be present at the bottom of the tank cars.

It is our opinion that, if fueling stations are equipped with suitable filters, which are properly maintained, and that if allowance is made for sedimentation at the bottom of storage tanks, by keeping suction lines a reasonable distance off the bottom, and if periodic checks are made of condition, water will not present a serious problem.

Manually-Operated Drain Cocks

By GEORGE CLARK

Engineer of Water Service, Canadian National, Winnipeg, Man.

Fortunately, on our territory there has been no trouble attributable to water contained in the fuel oil. All storage and service tanks are fitted with a non-freezing drain cock which is periodically operated to check on any water accumulation and eliminate same if present.

Obviously, there can be no trouble so long as the dewatering valves are regularly operated on every storage vessel. In our opinion, it is better to use manually-operated valves so the actual amount of water can be observed and measured, if necessary, rather than utilize any kind of automatic float operated dewatering device which would not permit such observation to be made.

If there is water, one should know from whence it came and if the volume is greater than a permissible minimum. If excessive water is present some appropriate action should be taken to prevent repetition in other shipments and adjustment obtained on shipments so polluted.

Cellulose-Type Filters Used

By J. W. USSHER

Engineer of Lubrication and Water Treatment, Canadian Pacific, Montreal, Que.

The most important factor is to obtain your fuel oil from the refinery with a minimum amount of water. In this connection, we have been very fortunate to date and the

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To be Answered In The March Issue

1. When installing ties more than 8 ft long, should the length of tie tamped be increased inside of the rail? Outside of the rail? How much? Explain.

2. What factors cause concrete curbs at passenger platforms to be pushed out of line toward the track? What measures can be taken in the construction of these curbs to prevent this condition from developing? How may they best be realined? Explain.

3. Should the crossings between main tracks and highways be "double" flanged or "single" flanged? What type of construction provides the most effective flangeway? Why? Explain.

4. What considerations should govern the permanent assignment of power tools and machines to a gang engaged in the maintenance of timber bridges and trestles? What tools should be so assigned? Explain.

5. What causes rail to kink at the heel of a turnout? How can this be overcome? Explain.

6. What are the most economical methods of improving existing coach-watering facilities to meet present-day sanitation regulations? Explain.

elimination of water has not been a particular problem.

With efficient control methods, fuel oil received in tank car lots may be handled in such a manner that contamination from water is not transferred to the storage tank. However, some preventive methods are required and filtration through cellulose-type filters, which tend to absorb water, installed in the unloading and dispensing lines tend to remove small quantities of water. If large wayside storage tanks are used, the majority of water in the oil settles to the bottom and may be drained out from time to time. In addition, the take-off line to the dispenser is installed approximately 18 in from the tank bottom.

One of the major problems in this connection is with moisture that is in solution and cannot effectively be removed by the above-mentioned methods. As the amount of this water in solution is relatively small, it is not a particular problem during warm weather; however as temperatures decrease the water crystallizes out and tends to freeze in the suction filters and emergency-fuel cut-out valve. To overcome this problem, we have equipped the storage tanks with exit heaters, which supply fuel oil to the diesel units at 60 to 70 deg F. In addition, where such heaters are not available, alcohol is supplied to the diesel fuel-oil tank.

Fouling of Ballast

To what extent, if any, has the introduction of diesel locomotives reduced the maintenance of ballast due to fouling? Explain.

Three Sources of Fouling

By A. P. Crosley

Engineer Maintenance of Way, Reading, Philadelphia

I believe that it is generally recognized that ballast fouls from three sources:

(1) Cinders and front-end refuse.

(2) Material blowing into the ballast, either from car lading or countryside.

(3) Materials working up into ballast from the subgrade.

The introduction of diesel locomotives will reduce or eliminate item No. 1. However, causes No. 2 and 3 will still prevail. I believe there will be little argument on item No. 2. Item No. 3 may be subject to some controversy, but when it is considered that lack of drainage, water pockets and other unstable conditions are largely the cause of fouling ballast from below, it is apparent the diesel locomotive is not the answer.

No Reduction in Maintenance

By A. W. Schroeder

Vice President and General Manager, Chicago & Eastern Illinois, Chicago

"Shakings" from locomotive tender contribute a share of the foreign material in all types of ballast. It would be difficult to estimate the percentage of ballast fouled by coal dust and fines dropped from locomotive tenders, but an old rule-of-thumb method used by section foremen to locate rough track was by noting where the largest amounts of coal or coal dust were to be found along the track.

The problem of trying to determine the amount or extent of foreign material shaken from steam power is further complicated by the fact that coal-hauling roads, entirely dieselized, still have a great amount of foreign material which falls from various types of rolling equipment while they are passing over the road.

It would be my conclusion that, in the final analysis, the introduction of diesel power has very little effect in reducing the fouling of ballast.

Tightening Rail Joints

When applying rail joints, in what order should the bolts be tightened? Why? Explain.

Several Schools of Thought

By E. M. Unzicker

Division Engineer, Gulf, Mobile & Ohio, Bloomington, Ill.

The answer here concerns specifically the "tightening" of bolts after assembly, that is, when the angle bars and bolts have been put in place and the nuts lightly snugged up. I shall, therefore, confine my discussion to that period when the very last two or three turns are given before the joint is considered sufficiently tight.

In considering this question of order, I can see it from three angles, viz: theoretical, practical and economical. Perhaps the last two go together.

On the theoretical side I have found two schools of thought. One holds that it would be better to tighten the two middle bolts first, and the other, just the opposite, or both end bolts first. This I base mostly on opinions expressed by some of our older and long-experienced foremen. Personally, I think that the question could be, and/or should be, best answered from experimentation in the laboratory.

The "middle" school think they can get a tighter fishing-surface fit under the ends of each rail and that this would be advantageous if anticipated droop might develop.

The "end" school think that tightening the middle bolts first might put a little permanent kink in the angle bars, because not having been machined to fit, they would ride hard on the ends and thus develop a lot of leverage. In effect, this would be somewhat comparable to first driving a nail "home" in the center of a board, rather than driving one on each edge and the middle one last and lightly. It is also thought that, if droop developed later, further tightening would be possible and helpful at the middle.

In substituting new or reformed bars on rails that have been in service quite a few years, the middle men contend those bolts should be tightened first so as to take up the gap caused by wear on the underside of the rail head and help take out the droop or even crown the joint a little. They

also contend that this practice is backed up by the recommendations of some welding people in connection with the building up of rail ends.

There might be a third school mentioned, by a few of each of the first two schools, especially the "enders," who think the ideal might be the tightening of bolts in the order of the recommended practice used when mounting a wheel when changing an automobile tire. That is, considering the track bolts numbered 1 to 6, consecutively from left to right, they should be tightened in the order 1, 6, 2, 5, 3, 4. But while this seems good we all agree the necessary jumping back and forth would be slow and not practical or economical, especially when using a bolt tightening machine.

Therefore, inasmuch as the saving of time and labor costs is the essence of economy, the most frequently accepted practice is to tighten all nuts on one side of the rail in the direction of rail laying and then swing the machine over the rail and tighten the nuts on the other side of the rail in the same order.

Order of Tightening Important

By Troy West

Engineer of Track, Union Railroad, East Pittsburgh, Pa.

In my opinion the order of tightening track bolts in applying rail joints is important because the subsequent upkeep of the joint will be affected. In placing rail joints under various circumstances such as joining new rail to old rail of the same weight where the old rail is seated or where off-set bars are installed, there are conditions to be met in coupling up which may require the placing of certain bolts first. In assembling a rail joint on a sharp curve, it might be necessary to place the end bolt first and follow through so as to bring the rail ends into alinement for the final seating of the joint.

To complete the installation after coupling up, the next step should follow certain procedures to insure a properly installed joint. After the bars have been seated, making sure of proper bearing top and bottom, the two bolts next to the joint should be tightened first. The remaining bolts, in order, should then be tightened throughout the joint. Where the bolts are tightened by hand wrench, a tightening-up turn should be made by one pass in the above order. The rail joint should then be struck lightly to make a closer fit. Afterwards, an attempt should be made to make another turn of the nuts in the same order from the joint out.

Where the bolts are tightened by the use of a track-bolt machine, the two bolts next to the joint should be tightened first, the rest of the bolts following in order.

The purpose in so tightening the bolts is to insure a properly supported joint and to maintain the tightness of the center bolts which are in the immediate area where joint hammer develops a repetitious blow. It seems reasonable to assume that a good supporting joint is maintained where bolt tension is kept proper. This tends to extend the service life of the rail.

Tight Bolts Important

By J. C. Larry

Supervisor of Road, Baltimore & Ohio, Elyria, Ohio

This is a very important subject, since it is the weakest part of the track structure, and therefore should have the utmost attention of the person in charge of the work.

The first step that should be taken when applying rail joints is to paint the rail ends with a heavy oil or other lubricant. This also applies to the joint bars which should also be painted at the top and bottom. This will insure longer life of the rail ends and the joint bars and also ease the longitudinal movement of the rails. The oil will keep the rail ends and joint bars free from rust which hinders this longitudinal movement.

A good steel spring washer should be used with all bolts in the joint; this will insure a more uniform tension on all the bolts after they are tightened to the required tension. This tension is best secured with a power bolt tightener, since these machines can be adjusted to provide whatever tension is needed.

I have tried different ways of tightening the bolts in the joints and my experience in this type of work shows that the best results were always accomplished when the two middle bolts are tightened first. The end bolts are then tightened to bring in the joint bar at these points. The remainder of the bolts are then tightened and the bolts first tightened are checked before leaving the joint.

Track bolts should never be overtightened as this will cause frozen joints and prevent the rails from expanding and contracting. The bolts also will have a tendency to break due to excess tension.

Bolt tension should never be allowed to get below 5000 lb. When the bolt tension falls below this point, you have a condition that all M/W men do not like, as loose bolts will cause considerable wear on the rail and joint bars, and will cause rail ends to batter resulting in lipped joints and poor line and surface.

Tighten Center Bolts First

By John C. Rouse

Roadmaster, Southern Pacific, Glendale, Ore.

After laying many miles of rail, new and secondhand and observing the joints where the bolts were tightened without any system and comparing them with joints where the bolts were tightened in a systematic manner—the tightening of the center bolts first and the end bolts last—I have come to the conclusion that a better job of line is obtained in the joint area when bolts are tightened systematically.

It has been past practice where a power wrench was used on the rail job to tighten all the nuts on one side of the joint and next tighten the ones on the opposite side. However, since this method does not always bring the ends of the rail into "line," it sometimes results in poor line not to mention loose bolts after traffic has passed over the joints for three or four weeks.

The reasoning behind the procedure of tightening all the bolts on one side of the joint first and then tightening the bolts on the opposite side is that on a four-bolt joint, the operator had to cross the machine over the joint twice in order to tighten the center bolts first and, in a six-bolt joint, cross it over five times in order to get the two center bolts first and the other bolts in rotation towards the end of the joint.

In order to obtain a better job of line in the joint area, and a better job of bolt tightening, I have found that the best results are had by tightening the two center bolts first—then the end bolts. This method has the effect of "ironing the wrinkles" out of the joint from the center towards the ends, thereby bringing the rail ends into as true a line as possible and re-

ducing the number of loose bolts in the joints, which would eventually result from the method of tightening bolts on one side first.

Those contemplating laying rail should train their power-wrench operators to tighten the center bolts first and work to the outer ends in rotation, even though on some of the larger rail jobs it is necessary to put a helper with the power-wrench operator to assist in making these extra moves. The better quality of the rail job—fewer loose bolts and better line in the joint area—will more than offset the cost of the extra man with the power wrench.

How Much Rail Wear?

What percentage of the ball of a rail can be worn away before replacement is considered necessary on primary main lines? On secondary main lines? On branch lines? Explain.

Objects to "Percentage Loss"

By H. M. Tremaine

District Engineer (Retired), Northern Pacific, Spokane, Wash.

In formulating this answer, the meaning of the term "worn away" is interpreted as "loss of metal." This refinement seems desirable because at times there is a definite deformation of the rail head which requires replacement without appreciable loss of weight.

The writer, from his own experience, thinks it would be idle to consider a percentage of loss in the rail head as the determining factor in its renewal in any of the three classes of track named.

Rail in tangent track is not renewed because of metal loss, expressed percentage wise. Such a loss is small.

Rail in curved track may be removed for wear. In this case the loss of metal occurs on the inside side of the head of the rail laid on the outside of the curve. Such wear approaches its critical stage when the gage of track is affected or when it permits the wheel flanges to strike the angle bars. This rail renewal may simply take the form of transposing rail from the high to the low side of the curve or may involve a complete track renewal.

A Controversial Question

By H. G. Carter

Chief Engineer, Central of Georgia, Savannah, Ga.

The question of the loss of section of the ball of the rail laid in various locations is controversial. The type of traffic, and the speed at which it is handled, have a decided bearing on the subject as do the curvature and grade of the track. The fact that the so-called secondary main lines handle the same type of traffic, with the same type of engines (since dieselization) at only slightly reduced speed, as do the main lines must not be lost sight of. Branch lines, so designated to imply very light traffic at lesser speeds, carry the same axle loads as the main lines.

On primary main lines the rail on tangent track will seldom require renewal due to the deformation of the ball, while on curves the deformation of the ball due to wear will vary directly in proportion to the degree of curve on which the rail is located. This will apply to the rail on the inside of the curve as well as to the rail on the outside of the curve. Generally speaking, established practice for years has considered it permissible and safe to allow rail to remain on the high side of a curve until 25 per cent of the ball has been worn away. In most cases this will be found to be the limit of wear that can be allowed before the wheel flanges strike the top reinforcement rib on 100 per cent headfree joint bars.

However, considering the rail wear we are encountering with diesel engines, because of the small wheels with their wide axle spacing and the resulting increased angle of contact between the wheel flanges and the rail head, which causes a decided abrasive and gouging action on the ball of the rail, the gage side of the ball is left rough and torn, thus inducing increased friction. It it therefore questionable whether or not the practice of allowing a 25 per cent loss of ball section is permissible without thorough lubrication. It may be found that, when the gage side of the ball has worn to the point that it makes full contact with the wheel flange, particularly on curves of over 4 deg, the rail should be removed from primary lines and placed in secondary lines where reduced speeds are encountered, for the remainder of its service life. This life can be prolonged by turning the rail to reverse the gage side.

Adequate lubrication is desirable and is essential in prolonging the service life of rail on the outside of curves and reducing the hazard of operation.

It might be well to mention here the rail wear encountered on the insides of curves. There is little loss of metal due to wear on this rail, although the ball section becomes badly deformed from the spreading and flowing due to the abrasive action of the wheel treads on the top of the rail. The replacement of this rail consequently cannot be gaged by the loss of section, but rather by the degree of deformation. It has been my observation that the low rail of a curve can be safely run until it begins to show corrugations where the wheel tread slips. When it has reached that point of wear, it should be immediately removed.

On secondary main lines the loss of ball section should not exceed 25 per cent on either side of the rail. Where it has 25 per cent loss on one side, it can be turned and used until it has lost 15 per cent of the ball section on the other side. This rail can then be used on branch lines, if desired, using the side of least wear as the gage side of the ball.

Change "Necessary" to "Desirable"

By J. W. Diffenderfer

Supervisor-Track, Pennsylvania, Johnstown, Pa.

I am taking the liberty of changing the word "necessary" to the word "desirable" to give more reality to this question. Often, what is necessary is not that which is desirable. Economic conditions or short-sighted policies carried out in the name of economy often dictate that the undesirable be done.

There should be no reason to differentiate between the standards set for railhead wear on main lines

and those for branch lines. Safety should be of the first importance in either instance. The limitations of rail-head wear beyond which rail would be considered unsafe for main line use should likewise be applied to rail used on branch-line operation.

The riding qualities of track with curve-worn rail are of secondary importance when the rail head has become worn to the extent that the safety of operation is endangered. Curve wear that is uniform will not generally so seriously affect the riding qualities of a curve that they cannot be corrected by alining the track. Neither will vertical wear of the rail head seriously affect the riding qualities, except in the instances where corrugations occur and they are not being considered in this instance.

Therefore, the necessary limits of rail wear should be considered as those that experience has shown will permit the maximum of wear with safety. These limits are neither recommended nor desirable, yet they are limits that for one reason or another have been caused by, and are permitted to develop and exist under, normal traffic conditions until provision has been made for rail replacements.

Under good tie conditions, curve wear can be permitted to go as high as ¾ in before regaging becomes necessary. So long as safe gage is maintained, rail wear can continue until over 1 in has been worn from the side of the rail head. It has been known to continue in many instances until the flanges were wearing in line with the web of the rail. Long before this takes place, the rail should have been transposed, or, if already transposed, should have been turned to permit continuation of the wear against a full rail-head section. Once again, rail-head wear could continue, and has done so, until the side of the rail head is worn another inch, or in line with the rail web. In rail that originally had a 3-in wide head when new, the curve wear in only five years' time has been known to reduce that width to only 1¼ in by wearing ½ in from one side before the rail was turned and over 1 in from the other side of the head after it was turned.

Such conditions are certainly not desirable. They are not recommended. It is difficult to call them necessary. They do show, however, what can be done when rail is not made available for renewal.

Vertical wear of the rail head has its limits also. As much as ½ in has been worn from the rail head without any serious consequences, except that when such a condition occurs, the wheel flanges invariably begin striking the splice bars. Bad joint conditions are the inevitable result. Under heavy tonnage traffic, however, rail that is worn thin vertically will develop head-web separation failures. Rail that has been worn vertically more than ¼ in should not be subjected to heavy tonnage traffic and should not be laid on the low sides of sharp curves. Heavy traffic would only increase the wear and bring on an unsafe condition so rapidly that the expense of laying the rail would not be justified.

The trouble with rail that is worn by either curve wear or vertical wear to the limits described is that it serves no useful purpose thereafter and is good only for scrap. Often, rail that has become worn to a desirable limit, can be relaid in a yard track or siding where the future wear will not be great, and where the relaid rail will greatly strengthen the structure of the track in which it is laid. That certainly is far better than wearing the rail to its necessary limits and then discarding it.

For safety, for a good ride and for reuse of the rail, the desirable limit for curve wear should be placed at no more than ½ in. Vertical wear should not exceed ¼ in. These limits could apply to either branch or main lines. The amount of new rail made available will determine how closely the wear will be permitted to approach these limits on the main lines. Rail that is not worn beyond these desirable limits could do a good job on the tangent portions of yard tracks, sidings, and secondary branches.

Economics and company policies will dictate and differentiate between the necessary and the desirable wear limits. It is worthwhile considering, however, that what is often thought to be economy, in wearing rail until it is good for nothing but scrap, is nothing but false economy through the waste of labor in handling it and the waste of rail that could otherwise have been used to strengthen other track structures of lesser traffic and importance.

Caulking Railway Buildings

What are the advantages of a regular schedule for the caulking of the doors and windows of railway buildings for the prevention of heat loss? Should all buildings be included? By whom should the necessary inspections be made?

Regular Schedule No Advantage

By J. B. Schaub

Assistant Engineer of Buildings,
Illinois Central, Chicago

Every building, when constructed, should be properly sealed or caulked around the doors and windows to make a weather-tight joint. On addition to caulking for the prevention of heat loss, it may also be advisable to caulk to prevent deterioration from the weather. This may be accomplished by attention to the details of construction, thereby making the application of special caulking ingredients unnecessary. Assuming the work to be properly done it will be many years before any additional work or caulking will be necessary.

There is no advantage in having a regular schedule for this work. The inspections, to determine the necessity for window and door caulking, should be carried on as part of the never-ending observation and inspection that is done by supervisors and building maintenance employees. Whenever the need for caulking is observed it should be noted and the work done together with other work on the particular building.

Of caulking is needed to prevent deterioration from weather, it would be well to have the work done at the earliest possible date. This class of window and door caulking applies to all railway buildings.

Caulking of windows and doors to prevent heat loss only, is not necessary or justified in connection with unheated buildings and its justification is questioned in connection with buildings that are only slightly heated or not subject to low temperatures.

The location of the building with respect to climatic conditions has considerable bearing on the justification of caulking. Naturally, in very cold climates caulking is much more necessary than it is in milder climates. In localities where it seldom or never freezes and where temperatures drop for very short periods of time, the expense of caulking for the prevention of heat loss can hardly be justified.

(1) There is no advantage in a regular schedule for caulking windows and doors.

(2) Inspection should be made by supervisors and regular building maintenance employees.

(3) All buildings should be inspected for weather tightness and caulked where there is need.

(4) No need to caulk for heat loss in warm and mild climates.

Operating Truck-Equipped Bridge Gangs

What is the economical radius of operation of truck-equipped bridge gangs? Explain.

No Categorical Answer

By T. M. Von Sprecken

Assistant to Chief Engineer, Southern, Washington, D. C.

This is a question which cannot be answered categorically. It is determined by time factors. The problem is, how much time can be lost going to and from work before it is more economical to move the men closer to the job, or in the case of a gang with fixed headquarters, to bring in a force from the line. Accessibility of track from highways, character of the highways and traffic congestion affect the answers.

Involved in this is the lunch problem. Is it customary to return to headquarters' cars for lunch or can it be carried to the job? Weather conditions can affect this. In fair weather, men can take a lunch with them although a hot meal is preferable. In cold weather it is more important to get them under shelter for a hot meal.

This all adds up to a practical limit of about two hours' time as the maximum which can be lost in going to and from work. With one round trip a day, a maximum radius of about 30 miles is indicated. For two trips a day this will be cut to about 15 miles. Heavy traffic congestion also reduces the range.

It is obvious that the most economical way to operate is to camp the men close to the site. If the question can be expanded to cover truck-and-trailer equipped gangs the range can be extended. A recent trend on some railroads is to put the maintenance forces in highway trailers which can be parked on the right of way close to and in many cases right at the job site. Where conditions permit its adoption, this appears to have advantages, among which are:

(1) Avoid dependence on work trains and locals for moving forces. Work trains are becoming very scarce and many locals run at night when it is undesirable to move camp cars. Moving time can be set with sole regard to the ecenomy of the move and not at the convenience of the dispatcher or the local's schedule.

(2) Makes use of highways, for the maintenance of which the railroad's taxes are used. In this way the railroads get some return out of the taxes they pay.

(3) Increases the economical radius of operation by permitting the moving of the camps from job to job, and lost time is cut to a minimum.

Radius of 15 Miles

By G. G. Thomas

Engineer of Bridges, Atlantic Coast Line, Wilmington, N. C.

The normal operation of a bridge force equipped with conventional track motor car and push car will involve moves of from 2 to 8 miles between the camp cars and the work. The travel time consumed in one move, one way, will be from 8 to 24 min.

The same force, truck equipped, will be able to move from 5 to 15 miles in the same time intervals and with a comparable loss of work time.

For work requiring one or more work weeks it will be economical to cover work within a radius of 15 miles. This means a track distance of 30 miles before forwarding the camp and work equipment to a new location. It will, however, be economical to make longer initial moves, as between more widely separated jobs, up to distances of from 25 to 50 miles, provided the camp and work equipment can be moved on the same day to a location within 15 miles or less, so that the camp cars will be available at the new location by close of work on the same day.

The foregoing is based on average conditions in Southeastern Coastal Plain or Piedmont territory. Consideration has not been given to such items as:

(1) Comparable risks of operation of track motor cars as compared to operation on highways.

(2) Comparable operating and maintenance costs of track motor cars versus trucks on highways.

(3) Time required to secure line-ups for track motor cars.

(4) Time saved at the conclusion of one job and required for loading and unloading track motor cars and equipment, as compared to movement of truck by highway to new location.

(5) Safety and time saved in highway movements in daylight and in emergencies, especially after dark, as compared to similar track-borne movements.

Limit 2 Hrs for Round Trip

By W. S. Broome

Assistant Chief Engineer, Colorado & Southern, Denver, Colo.

For bridge gangs quartered in outfit cars, the economical radius is, of course, one-half the distance between adjacent service tracks. Present rates of pay for bridge men make it imperative that these men be actually working on bridges or structures every practical minute during the working day. Therefore, it is better to move boarding outfits frequently rather than to transport men long distances over highways.

For bridge gangs not quartered in outfit cars, such as terminal gangs, the maximum economical distance is somewhere close to 40 miles. Usually a gang can be transported in a truck that distance in approximately one hour. Thus, only two hours are lost per working day in transporting men to and from the work. When the distances are greater than 40 miles, it is better to assign the work to a gang housed in outfit cars. Of course, in times of emergency, terminal gangs are transported in trucks greater distances than 40 miles. Usually in such cases, the men are quartered in hotels near the work until the emergency has passed, or until a portable outfit can be moved in. Such cases, of course, are exceptional and result in hotel expenses

for the entire gang. However, the saving in time will usually compensate for such expenses.

Place Gang on Job

By L. L. ADAMS

Chief Engineer, Louisville & Nashville, Louisville, Ky.

To handle maintenance and small construction bridge work a bridge gang equipped with a truck should economically handle all such work within a radius of 25 miles. Such a gang, when located at points where several short branch lines diverge from the main line, can handle bridge work for 50 miles of main line, and possibly 30 or more miles of branch lines, depending on their location and length.

Where a bridge job is of considerable magnitude, either repairs or construction, which will require a gang of reasonable size over 30 days to complete, it is more economical to construct a temporary track at one end of the work so that camp cars can be set out and men placed where no time will be lost in going to and from the camp in the morning, noon and evening. If the distance to be traveled by such a gang, to and from work either by truck or motor car, is in excess of 4 or 5 miles, it is more economical to place the gang on the job as explained above.

Highway Availability Important

By E. L. ANDERSON

Chief Engineer, St. Louis-San Francisco, Springfield, Mo.

In discussing this subject it is considered that it applies to gangs engaged exclusively in repairing or rebuilding bridges of timber, concrete or steel construction. To determine the economical radius of operation of such gangs, three different types of work performed should be given consideration:

(1) Emergency work.
(2) General repair work.
(3) Complete rebuilding work.

Further, the type of gang and the method of housing must be given consideration as follows:

(A) Gang headquartered at a permanent location and not supplied with living quarters.

(B) Gang quartered in outfit cars or trailers with movable headquarters.

The major item for consideration in determining the economical basis of truck operation after gang analysis is the condition and availability of highways between the point where the gang is headquartered an the point of work. Also to be considered is the question of the ready accessibility of the bridges from the highways.

Under item No. 1 above, the distance is limited only by existing requirements and the possibility of trucking men to the location. Under such conditions it is not unreasonable to truck men as far as 100 miles.

Under item No. 2, where repairs are made that require only one or two days time, a maximum distance of 50 miles is often economical.

Under item No. 3, a maximum distance of as much as 20 miles may be economical where it is required in connection with the provision of proper facilities for headquartering the gang.

The type of gang being used has some bearing on the maximum distance that is economical. The "A" type gang with permanent headquarters eliminates the need of outfit cars or trailers which would be furnished by the company. This permits greater economical distance of operation by truck. Under these circumstances gangs of type "A" could be economically operated at many locations at maximum distance of 30 miles, while gangs of type "B" generally should be kept to a maximum of 15 miles from point of work for economical operation.

It should be easily discerned from the above that the economical distances for operations can be set up only tentatively. Study should be made of the type of territory, availability of towns for living facilities, condition of highways and accessibility of bridges before definitely deciding on equipping bridge gangs with trucks for transportation. In fact, it is often preferable and economical to furnish bridge gangs not only with trucks for transportation of men and material but also to provide motor cars as auxiliary transportation.

CORRECTION

In the answer appearing under the head "Use One Gaging Foreman" on page 69 of the October issue of *Railway Track and Structures*, the name of the author was incorrectly given as Emilio Geraro. This should have read Emilio Siravo.

PRODUCTS
OF MANUFACTURERS

New, improved equipment, materials, devices

ROLLER-APPLIED FINISH

DESIGNED to reduce paint loss from overspraying when painting storage tanks and other industrial facilities with spray equipment is a new roller-applied aluminum finish announced by the Transportation Sales Division of the Sherwin-Williams Company, Cleveland, Ohio.

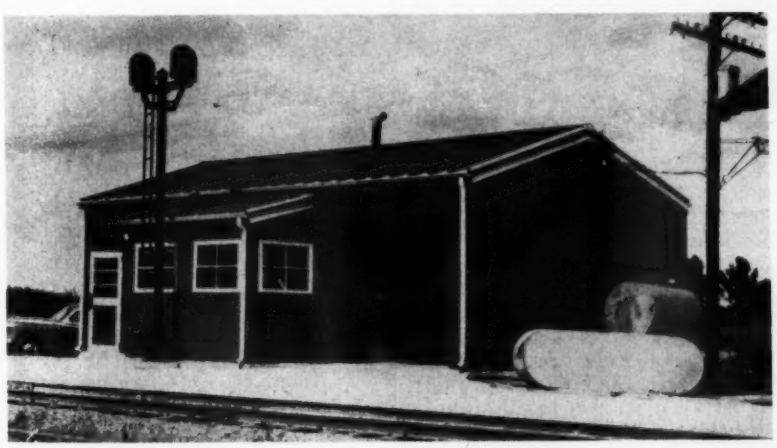
Known as Kem-Plate aluminum finish, the material is reported to cover uniformly without lap marks, to speed the painting of metal structures and to require less scaffolding than when applying paint by brush. Long-handled rollers are used to apply the material on bulky facilities and shorter-handled rollers can be used on other installations, such as steel woven fence. After the surface has been primed, Kem-Plate aluminum finish is applied at package consistency. The material dries to touch in one to four hours, and dries to recoat in 24 hrs. Approximate coverage is 700 to 800 sq ft per gal.

NEW SHOVEL-CRANE

THE LINK-BELT Speeder Corporation, Chicago, has announced production of a new lightweight ¾-yd shovel-crane known as the LS-68 and replacing the Model LS-52.

Important features of the new shovel-crane include a heavy, wide lower frame with 11 ft overall length and a 9-ft 2-in width using 24-in shoes, or a 9-ft 8-in width with 30-in shoes. Flange track rollers are 10 in. in diameter and are heat-treated forged steel equipped with bronze-bushings and mounted on 2½-in diameter shafts. The LS-68 weighs 35,300 lb as a standard shovel, and the machine is fully convertible to all standard front-end attachments with no major changes to principal machinery necessary.

A mechanical feature of the new unit includes separated drum gears and clutch shells. This permits the use of alloy cast iron shells designed to give better friction action and longer lining life. The clutch shells are bolted to the drum gears. The machine is also equipped with six conical hook rollers, four being located as equalized pairs in front, while the other two are mounted individually in the rear.

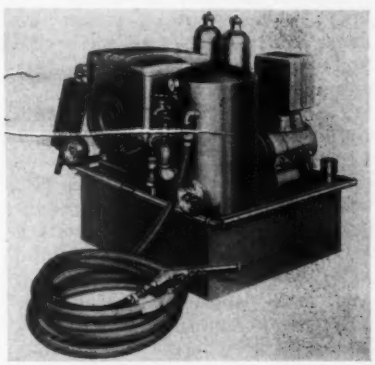


STEEL BUILDING

A NEW MODEL of its interlocking steel-paneled building, known as the series S 40-ft Steelox building has been announced by the Armco Drainage & Metal Products, Inc., Middletown, Ohio. Reduced weight and more efficient design are reported to result in economies of more than 10 per cent over older models. Lightweight bar joists make possible the use of somewhat lighter load-bearing roof panels, thus, it is said, resulting in a lower erection cost as well as in reduced freight costs. A reduced roof load design is also available, which provides increased structural spacing for buildings to be erected in the more southerly areas of the country. Another improvement provides additional wall caps at the eaves, and an improved ridge design gives more positive weather tightness and protection against fine blowing snows.

The new buildings are available in heights up to 20 ft, and the 40-ft structures can be placed side by side, as well as end to end, thus making the total floor area to eb enclosed virtually unlimited. Columns are placed every 40 ft in one direction and every 20 or 32 ft, as required, in the other direction.

Leanto's are also available, and combinations of these units with the main building can provide extra floor space in some cases for as much as 50 per cent under the price of a complete building.

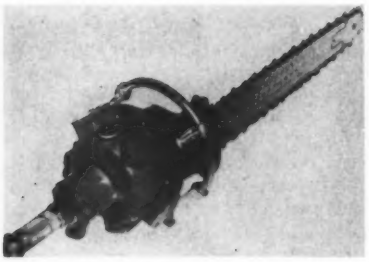


DUAL-PURPOSE POWER PLANT

A SELF-CONTAINED combination fire-fighting unit and portable electric generating plant, known as Versa-Power, has been announced by the National Alarms Corporation, LaFayette, La. The unit consists primarily of an Onan 3500-watt electric generator, a Ruth-Berry water pump and two tanks, one of 15-gal capacity for treated water and the other of 64-gal capacity for untreated water.

As a power plant, the gasoline-engine-driven generator provides power for communication units, electric tools and for standby service. In addition the generator supplies power for the water-pump motor and floodlights which can be mounted on the unit. The Versa-Power is equipped with a 50-ft length of flexible hose and a fire-truck-type spray nozzle through which either plain water or water treated with a chemical solution called Unox can be directed onto fires.

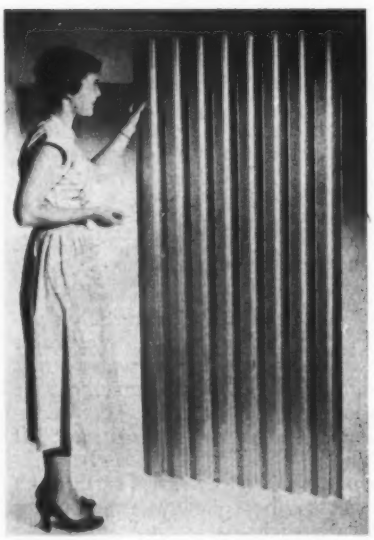
The dimensions of the Versa-Power are 30 in by 35 in in plan and 40 in in height. The unit weighs approximately 700 lb.



AIR-POWERED SAW

AN AIR-POWERED version of the Portocut saw, designed for use in continuous, heavy-duty construction service, has been announced by the Vulcan Iron Works Company, Denver, Colo.

The new saw is powered by a 3½-hp, 5-cylinder radial-piston air motor which develops positive and uniform torque at all speeds, thus eliminating the need for motor racing to secure power. The unit weighs 46 lb and is equipped with a two-strand alloy steel chain which removes a kerf of only 5/16 in. Ball bearings have been used throughout, and the cutter bar carries a spring-loaded ball-bearing mounted roller which reduces friction and wear and automatically applies power-chain tension. The Portocut features a high-carbon-steel cutter-bar with an easily replaceable wearing strip. The saw can be used for underwater cutting.



ALUMINUM SIDING

A NEW ALUMINUM siding, designed to enhance the appearance of industrial buildings, has been announced by the Aluminum Company of America, Pittsburgh, Pa. Known as Alcoa Ribbed Industrial Siding, the new siding sheets are intended primarily for use on frame-type structures, but also can be used as facing sheets on concrete block buildings.

The siding is available with an embossed finish in lengths of from 5 ft to 18 ft. The ribbed design of the sheet is achieved by trapezoidal corrugations, and the embossed surface offers a stuccoed effect which diffuses light as it strikes the bright aluminum surface. The siding sheets are .032 in thick, and are made from the same aluminum alloy as is used in other Alcoa industrial roofing and siding products.

To apply the sheets to structural steel framework, Widman fasteners, self-tapping screws, Nelson Rivweld studs and other conventional fasteners can be used. On old or new masonry structures the ribbed sheets can be applied with approved expansion-type fasteners or with fasteners fired from powder-actuated guns.

The manufacturer reports that the ribbed sheets are easily adaptable to the new type "sandwich" wall construction. By using two layers of aluminum siding with a center layer of glass fiber insulation, a wall can be built with an insulation value reported to be the equivalent of that of a 24-in brick wall.

WELDING ELECTRODE

A WELDING electrode, called Jetweld 2 HT and designed for welding high-tensile joints, has been announced by the Lincoln Electric Company, Cleveland, Ohio. The new electrode contains iron powder in the coating and represents another addition to the company's line of iron-powder electrodes designed for making specified types of joints rather than for use in all-purpose service.

Jetweld 2 HT is especially designed for high-speed welding of flat fillet and deep groove joints where high-tensile strength and low crack sensitivity are required. It is reported to give a low cost per foot of X-ray quality weld, have easy slag removal, top physical properties and smooth appearance. The electrode will operate on either ac or dc current, with ac operation preferred. It is available in 7/32 in diameter.

THE MONTH'S NEWS
Railway Personnel

General

A. B. Riley, bridge and building supervisor on the Northern Pacific at Minneapolis, has been appointed trainmaster on the Yellowstone division at Billings, Mont.

G. W. Oxley, assistant engineer on the Virginian, has been appointed superintendent safety at Roanoke, Va., succeeding **C. W. Dowdy,** who retired November 1.

G. M. Smith, division engineer on the Philadelphia division of the Pennsylvania, has been named assistant superintendent on the Chicago division.

F. R. Huddleston, supervisor of track on the Pennsylvania at Indianapolis, Ind., has been appointed to the dual position of supervisor of track and assistant trainmaster at Kalamazoo, Mich. **Harry Hill,** supervisor of track at Cadillac, Mich., has also been appointed in the dual capacity of supervisor of track and assistant trainmaster at Cadillac.

Gale B. Aydelott, division superintendent on the Denver & Rio Grande Western, and an engineer through past training and experience, has been named vice-president and general manager, succeeding **K. L. Moriarty** whose resignation to accept the post of chief engineer of the New York Central System was announced in the November issue.

Mr. Aydelott was born at La Grange, Ill., in 1914. He attended the University

Gale B. Aydelott

of Illinois where he received a BS degree in June 1936. The following month he began his railroad service with the Rio Grande as an extra gang laborer, later serving as a welder helper, chainman and compressor operator at various points on the system until being promoted to assistant extra gang foreman. During the next few years he served at various loca-

(*Continued on page* 56)

"WE NOW HAVE A DIRTY TRACK!"

"Two years with the purse strings pulled tight and no weed or brush killer included in our maintenance program—and our investment of previous years is scrapped."

"However, we have a sizable weed and brush control program for 1955."

"After our budget is approved, we would like to review this program with you."

Frank admissions like this one suggest the "PENNY WISE AND POUND FOOLISH" element when vegetation control programs are scrapped at intervals when perhaps the haul is off.

Engineers today recognize that funds disbursed *yearly* for vegetation control may be regarded as an investment to preserve the many advantages and the economies that a clean right-of-way assures.

With budgets in the making, it's a good time to review a vegetation control program.

A review of your requirements is invited.

READE EST 1883

THE READE MANUFACTURING CO., INC.

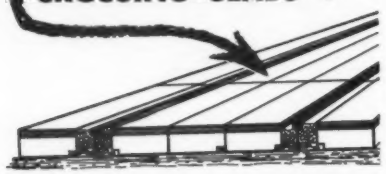
CHEMICAL WEED KILLERS

Jersey City 2, N. J.

Works:

JERSEY CITY • CHICAGO • KANSAS CITY
MINNEAPOLIS • BIRMINGHAM • STOCKTON
WESTERN OFFICE: CHICAGO 28, ILL.

PERMACRETE
Precast Concrete
Edge Armored
CROSSING SLABS



• Rail • Highway • Industrial
• Crossings

The accepted standard of low cost, smooth riding, permanent type crossings that require a minimum of maintenance — Steel reinforced concrete with treated oak fillers and flangeways to fit various rail sections.

Write for Bulletin CX-1

PERMACRETE
PRODUCTS CORPORATION
COLUMBUS 7, OHIO

Cribbing Houses Posts

Railway Personnel (Cont'd.)

tions on the road as a track inspector, engineering assistant, roadmaster and trainmaster. In 1947 he was appointed assistant to the chief mechanical officer at Denver, and in 1948 he was named division superintendent at Grand Junction, Colo., later serving in the same capacity at Denver and Salt Lake City.

Frank Nelson, Jr., real estate agent of the Norfolk & Western at Roanoke, Va., retired on November 1, after more than 45 years of service in that road's engineering department. **E. L. Rardin,** engineering department draftsman, has been promoted to right of way agent to succeed **W. B. Friend** who has been named real estate agent to succeed Mr. Nelson.

Mr. Nelson joined the N&W in March 1906 as levelman. He left the road five months later but returned as an engineering department draftsman in 1909. Transferring to the valuation department in 1913, he became chief draftsman in 1916. Later that year he became a "pilot" or guide, taking government parties over the road during the nation-wide valuation of railroad property. Mr. Nelson was promoted to assistant office engineer in 1925, office engineer in 1929 and chief land appraiser in 1930. He was transferred to the accounting department as chief land appraiser in August 1933 and was promoted to real estate agent in the engineering department in February 1945.

Mr. Rardin joined the N&W's engineering department as an axeman in October 1941, later serving as chairman and draftsman. After over three years of military service he returned to the N&W in 1946.

Engineering

Paul A. Perkins, track supervisor on the Southern at Cordele, Ga., has been promoted to assistant division engineer at Princeton, Ind., succeeding **D. H. MacLeod.**

M. C. Wolf, assistant engineer on the Northern Pacific, has been promoted to valuation engineer with headquarters at St. Paul, Minn., succeeding **W. H. Jahn,** who has retired.

J. H. Kelly, engineer maintenance of way—Lines East of the New York Central, has been appointed assistant chief engineer maintenance of way—system, with headquarters as before at New York. **K. E. Dunn,** industrial engineer of the system, has been appointed assistant engineer maintenance of way—Lines West at Cleveland, Ohio, succeeding **J. L. Cox,** who has been promoted to succeed Mr. Kelly as engineer maintenance of way—Lines East at New York.

W. M. Vogts has been appointed office engineer on the Pennsylvania with headquarters at Philadelphia. **L. A. Pelton,** supervisor of track, New York division, has been named assistant division engineer on the Columbus division with headquarters at Columbus, Ohio.

R. H. Carpenter, engineer of design on the Missouri Pacific at St. Louis, has been appointed district engineer at Little Rock,

MIX IT
hot
up to 5 tons per-hour
of highest type hot mix

MIX IT
cold
up to 10 tons per-hour
of cold patch

WITH THE NEW
B-G MIXALL

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the answer for all small paving jobs

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see your B-G distributor or write
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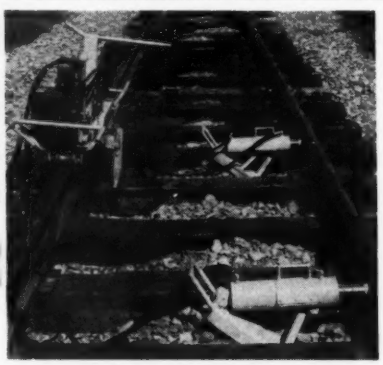
MODEL P-O
HYDRAULIC
TRACK
LINER



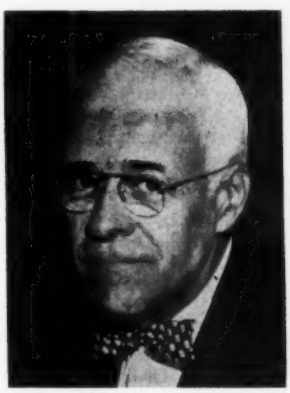
The Model P-O Hydraulic Track Lining Unit consists of two hydraulically operated rams and a portable power plant. Mounted for easy movement on a pair of double flanged rollers, it is stabilized on the rail by means of a hinged bracket support. The hydraulic pump is driven by a six-horsepower, air-cooled, gasoline engine. Either one or both rams may be used, depending on requirements. Foreman and four to five men line up to 6000-ft. of track per day.

SPECIFICATIONS: Length 54" Width 24" Height 30" Weight 275 lbs.

Write today for complete information
Railway Track-work Co.
3207 KENSINGTON AVE., PHILADELPHIA 34, PA.
TRACK MAINTENANCE MACHINERY
Rail Grinders • Switch Grinders • Cross Grinders • Surface Grinders • Rail Drills • Ballast Extruders • Bit Sharpeners • Tie Nippers • Grinding Wheels • Cut-off Wheels • Track Liners • Brushmaster Saws

Ark., succeeding **H. D. Knecht,** who has retired. **J. C. Boston,** principal assistant engineer at St. Louis, succeeds Mr. Carpenter. **G. W. Payne,** senior assistant engineer in the general engineering department at St. Louis, has retired after 46 years of railroad service.

A. P. Crosley, who has been appointed engineer maintenance of way of the Reading (RT&S, October, p. 77), was born on August 11, 1893, at Merchantville, N.J., and attended Cornell University (B.S. 1916). Entering railroad service on February 8, 1917, as a rodman with the Reading at Philadelphia, Mr. Crosley transferred to the main-



A. P. Crosley

tenance-of-way department in November 1917. He was appointed supervisor at Coatesville, Pa., in January 1921 and became division engineer at Harrisburg, Pa., in April 1928, transferring to Tamaqua, Pa., in July 1933 and to Philadelphia in August 1943. In June 1952 he was promoted to assistant engineer maintenance of way, becoming engineer maintenance of way last August.

J. W. DeMoyer, whose promotion to assistant engineer maintenance of way of

J. W. DeMoyer

the Reading was announced recently (RT&S, November, p 63), was born on February 16, 1905, at Pottsville, Pa., and attended Lehigh University, Bethlehem, Pa. (C.E. 1927). He entered railroad service June 1927 as a transitman with

(*Continued on next page*)

Underneath the River!

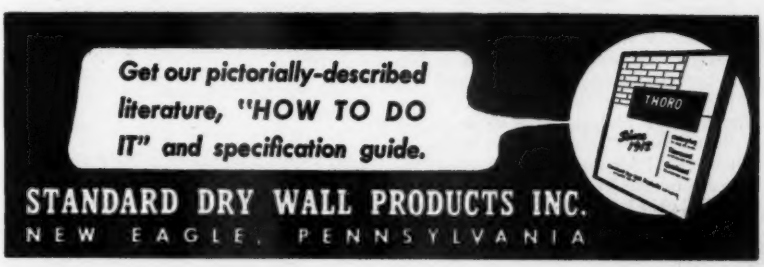
THORITE Patching Mortar Crew at work in Air Tunnel under East River, New York.

Sealing Leaks in Traffic Tunnel with WATERPLUG.

Sealing Drain Pipe Channels in Tunnel with WATERPLUG.

WATERPLUG Crew at work, before placing of tile lining, Battery Tunnels, East River, New York.

On many of the largest underground projects in the Americas and in foreign countries, WATERPLUG solves, for the contractor, his water problems. The job may be small or it may be large, the results are the same — Successful.


Get our pictorially-described literature, "HOW TO DO IT" and specification guide.
THORO
STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

Railway Personnel (Cont'd)

the Reading at Philadelphia, transferring to the maintenance-of-way department in April 1928. In June 1937, Mr. DeMoyer was appointed supervisor at Philadelphia, being transferred to West Trenton, N. J., in August 1943. He became assistant division engineer in June 1945, division engineer of the Philadelphia division in June 1950, and assistant engineer maintenance of way in August 1953.

A. B. Hillman, Jr., who has been appointed engineer maintenance of way for the Chicago & Western Indiana and The Belt Railway of Chicago (RT&S, November, p. 64), was born at Chicago on December 29, 1919. He attended the University of Illinois where he received a BS degree in civil engineering in January 1942. Prior to graduation he

A. B. Hillman, Jr.

worked part-time as a chainman on the Pennsylvania at Chicago and began full-time railroad service with the Illinois Central in December 1943, following service with the U.S. Air Force as a civilian instructor. After serving as a rodman at Clinton, Ill., between December 1943 and January 1945, Mr. Hillman was appointed assistant supervisor on the Springfield and St. Louis divisions, which position he held until September 1945 when he was named masonry inspector. In September 1946 he was made assistant supervisor on the Illinois division, and in April 1947 he was appointed acting supervisor of track at Clinton. He was promoted to supervisor of track at Decatur, Ill., in August 1947, later serving at Cherokee, Iowa and Council Bluffs. In July 1952 he joined the C&WI and BRC as assistant engineer, the position he was holding at the time of his recent advancement.

F. S. King, whose promotion to assistant division engineer on the Pennsylvania at Williamsport, Pa., was announced recently (RT&S, October, p. 78), was born at Pewaukee, Wis., March 17, 1919. He attended the University of Wisconsin where he received a BS degree in civil engineering in 1940 after which he joined the PRR as an engineering apprentice on the Toledo division in January 1942. He later served as an assistant in the engineering corps at various locations on the system until being promoted to assistant branch-line supervisor on the Maryland division at York, Pa., in July 1943. He was appointed assistant main-line supervisor in December of that same year and served in this position until April 1947 when he was named supervisor track on the Williamsport division at Sunbury, Pa. He later served in this same position on the Eastern division at Mansfield, Ohio.

Alex Manson, division engineer in charge of the Louisville & Nashville's Radnor Yard construction at Nashville, Tenn., has been transferred to Knoxville, Tenn., succeeding **J. E. Lockhart,** who has retired after 45 years of service.

A. J. Wilson, engineer of structures on the Union Railroad at East Pittsburgh, Pa., has been appointed assistant to chief engineer at the same point.

Track

R. N. Schmidt, formerly sales engineer for the Carter-Waters Corporation, has been appointed assistant roadmaster on the Frisco, at Springfield, Mo.

J. T. Brown, assistant roadmaster on the Seaboard at Miami, Fla., has been named roadmaster at Wildwood, Fla., succeeding the late **C. C. Clayton. W. S. McLendon,** assistant roadmaster at Savannah, Ga., has been transferred to Miami, succeeding Mr. Brown.

Mr. Brown joined the Seaboard in 1945, becoming assistant roadmaster on the Carolina division in 1950, and recently has been stationed in Miami.

H. N. Lucas, assistant supervisor of track on the New York division of the Pennsylvania, has been appointed supervisor of track on the Southwestern division with headquarters at Columbus, Ind. **J. M. Course, Jr.** has been appointed assistant supervisor of track on the Susquehanna division with headquarters at Williamsport, Pa. **R. W. Rohe** has been named assistant supervisor of track on the Maryland division at Baltimore, and **A. H. Renne, Jr.,** has been advanced to assistant supervisor of track on the Conemaugh division at Aspinwall, Pa.

L. V. Ball has been appointed roadmaster in charge of the Waltham and Maniwaki subdivisions and Ottawa Terminals of the Canadian Pacific, with headquarters at Ottawa, Ont., succeeding **J. H. Trottier,** who has been transferred.

Harry R. C. Wootton, assistant engineer on the New Brunswick district of the Canadian Pacific at St. John, N. B., has been named roadmaster at Peterborough, Ont.

Mr. Wootton joined the CPR in the summer of 1949, while he was still attending school. He first worked as a junior transitman on the Trenton division and in 1950 became a transitman on the Bruce division. He was transferred to the Toronto Terminals in 1951, and later became assistant engineer in the office of the vice-president and general manager. He was appointed assistant engineer at St. John last year.

Harry Diedrich Tietjen, who has been appointed supervisor of track on the Pennsylvania at Ashtabula, Ohio (RT&S October, p. 84), was born on April 6, 1925, at Orange, N.J., and attended Dartmouth College and the University of Michigan, receiving an A.B. degree and a B.S. degree in civil engineering in 1946 and 1949, respectively. He entered railroad service in August 1949 as junior engineer of track with the Pennsylvania at Chicago, transferring to Terre Haute, Ind., in January 1950 and to Dayton, Ohio, in February 1951. Mr. Tietjen was appointed assistant supervisor of track at Williamsport, Pa., in August 1951 and transferred to Huntingdon, Pa., four months later, where he remained until his appointment as supervisor of track at Ashtabula.

F. R. Matthews, whose promotion to supervisor track on the Pennsylvania at Anderson, Ind., was announced recently (RT&S, November, p. 68), was born at Abington, Pa., November 5, 1927. He attended the Drexel Institute of Technology from 1946 to 1950 during part of which period he also served as a rodman on the PRR at Wilmington, Del., in a cooperative program. In June 1951 he was appointed assistant supervisor track at York, Pa., later serving in this same capacity at Baltimore, Md.

Joseph Marik, who has been appointed roadmaster on the Canadian Pacific at Empress, Alta. (RT&S, October, p. 81), was born at Winnipeg, Man., June 10, 1916. Mr. Marik joined the Canadian Pacific as a section laborer at Standard, Alta., in 1930 and was promoted to section foreman at Piapot, Sask., in October 1951. During 1952 he served as relief assistant roadmaster, and during the summers of 1953 and 1954 worked as assistant roadmaster in charge of reballasting between Medicine Hat and Swift Current.

A. F. Richards, who has been appointed roadmaster on the Chickasha subdivision of the Frisco at Oklahoma City, Okla. (RT&S, November, p. 69), was born at Lyles, Tenn., November 15, 1916. He attended the high school at Afton, Okla., and entered railway service with the Frisco at that point as a section laborer in August 1937. He subsequently served as relief section foreman, section foreman and extra gang foreman until being appointed assistant roadmaster on the Cherokee subdivision in May of this year.

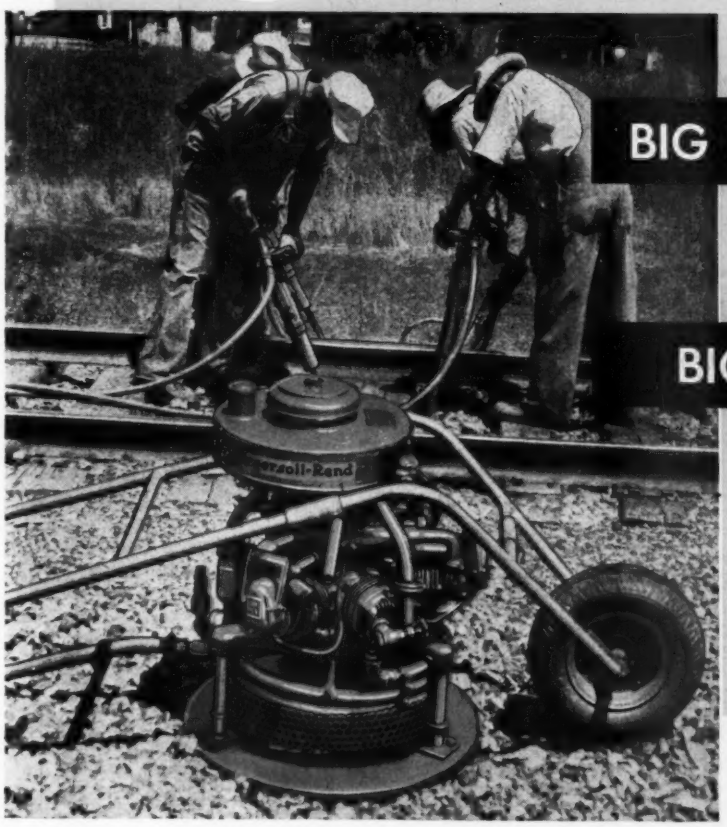
N. D. McCord, whose promotion to roadmaster on the Chicago & North Western at West Chicago, Ill., was announced recently (RT&S, November, p. 68), was born at Mt. Vernon, Ill., January 4, 1902. He attended Feitshans High School at Springfield, Ill., and began his railroad service with the Wabash in March 1922. In July 1925 he joined the North Western as a section laborer at Lick, Ill., later being promoted to section foreman in August 1928 and to track supervisor in July 1949. He was appointed assistant roadmaster at Chicago in June 1952 and served in that position until his recent appointment.

C. W. Geelhart, who has been promoted to roadmaster on the Milwaukee at Cedar Falls, Wash. (RT&S, Novem-

(*Continued on page* 60)

SPOT-AIR

the little compressor that does a big job



BIG IN PERFORMANCE

Operates FOUR Ingersoll-Rand MT-4 Tampers

BIG IN ECONOMY

SAVES SPACE—only 32" high on a 27" base plate

SAVES LABOR—readily moved from one spot to another

SAVES UPKEEP—rugged construction, minimum maintenance

The SPOT-AIR, operating *four* MT-4 railroad tie tampers, delivers 36 cfm at 80 psi. With wheelbarrow mounting shown, one man can readily take it almost anywhere.

From its comparatively small size, you wouldn't suspect this compact SPOT-AIR Compressor could deliver so much air power so economically.

SPOT-AIR weighs only 265 lbs. It's a self-contained, single-stage, gasoline-powered compressor. Because it is completely air-cooled, you can use it in any kind of weather—without danger of freezing in winter—or overheating in summer.

With *four* I-R Type MT-4 Tampers, the 3R-36 SPOT-AIR makes a complete air-tamping team. You'll find it saves time and improves work in practically any job where air power is applicable. For further information, see your nearest Ingersoll-Rand representative.

Ingersoll-Rand

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AIR TOOLS

Spike Drivers	Wood Borers	Backfill Tampers
Grinders	Riveting Hammers	Paving Breakers
Impactools	Rivet Busters	Pumps
Wire Brushes	Scaling Tools	Utility Hoists

COMPLETE IR AIR POWER TO MEET NEEDS OF ANY JOB

PORTABLE COMPRESSORS

A complete line in 36, 60, 85, 125, 210, 315, and 600 cfm sizes.

ber, p. 68), was born at Cedar Falls on June 20, 1914. He joined the Milwaukee in June 1932 as a section laborer at Bayne, Wash. He later served as relief section foreman, assistant extra gang foreman, section foreman, and general extra gang foreman, until being appointed assistant roadmaster at Cedar Falls in June 1944.

Bridge and Building

E. W. Prentiss, assistant engineer bridges and buildings on the Western region of the Pennsylvania at Chicago has been advanced to engineer, bridges and buildings, at that same point, succeeding **J. T. Walton,** who has retired.

David V. Messman, assistant engineer of bridges, Central Lines, on the Southern at Knoxville, Tenn., has been named engineer of bridges at that same point succeeding **R. Hayes.**

C. M. Rea, assistant bridge and building supervisor on the Northern Pacific at Fargo, N. D., has been appointed bridge and building supervisor at Minneapolis, succeeding **A. B. Riley,** whose promotion to trainmaster at Billings, Mont., is noted elsewhere in these columns.

John H. Hall, who has been named bridge and building supervisor on the Southern at Valdosta, Ga. (RT&S, October, p. 86), was born on January 3, 1920, at Weston, W.Va., and attended West Virginia University where he received a B.S. degree in civil engineering in 1948. Entering railroad service on March 1, 1948, as student apprentice with the Southern at Asheville, N.C., Mr. Hall was appointed track supervisor at Cochran, Ga., on January 1, 1950. He transferred to Hickory, N.C., on January 1, 1951, and to Asheville, N.C., on January 1, 1953, remaining at the latter point until his recent appointment.

C. R. Malmberg, whose promotion to supervisor bridges & buildings on the Chicago & North Western at Norfolk, Neb., was announced recently (RT&S, November, p. 70), was born at Crystal Falls, Mich., November 2, 1904. He began his railroad service with the North Western in August 1925 as a B&B carpenter on the Peninsula division. He was appointed assistant supervisor B&B on the Wisconsin division at Milwaukee in 1948, and later served as acting supervisor B&B on the Lake Shore division at Fond du Lac, Wis., the position he was holding at the time of his recent promotion.

Water Service

Wilbert F. Arksey, whose appointment as engineer water service and fuel facilities on the Great Northern at St. Paul, Minn., was announced recently (RT&S, November, p. 70), was born at Duluth,

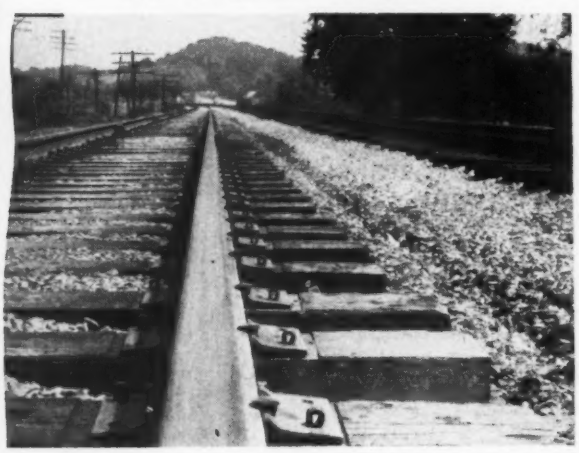
Wilbert F. Arksey

Minn., December 21, 1914. Following graduation from the University of Minnesota where he received a BS degree in civil engineering in 1936, Mr. Arksey joined the Great Northern as a chainman at Superior, Wis., in April 1937. He was named assistant to the superintendent in December 1937, at Minot, N. D., and in May 1940 was made assistant engineer water service at St. Paul. In November 1942 he joined the Military Railway Service, and served with the 704th Railway Grand Division in Africa, Italy, France and Germany. Following his discharge from the military service in December 1945 he returned to the Great Northern as assistant engineer water service, the position he was holding at the time of his recent promotion.

(*Please turn to page* 62)

USE TIE PLATE LOCK SPIKES

for Minimum Annual Cost of Ties in Track



• hold gage • prolong life of ties

• save maintenance expense

LOCK SPIKES hold tie plates firmly in place on cross-ties and bridge timbers. They are quickly and easily driven, or removed, with standard track tools. Driven to refusal, the spread shank is compressed by the walls of the hole. Tie plates are held against horizontal and vertical movement under spring pressure. Play between the spike and the hole is eliminated—gage is held and plate cutting is overcome.

LOCK SPIKES not only become integral with the tie plate, but also the lateral pressure by the legs against the sides of the tie hole, binds the spike in the tie. This unique feature gives tight adhesion between tie and plate.

LOCK SPIKES were first installed in 1947. Since they have been in track, no maintenance whatever has been required. Cost of installing in track is low and comparable to cut spikes. The advantages and saving only found in Lock Spikes reduces the annual cost of ties in track and maintenance expense to a minimum. We invite your investigation.

BERNUTH, LEMBCKE CO., INC.

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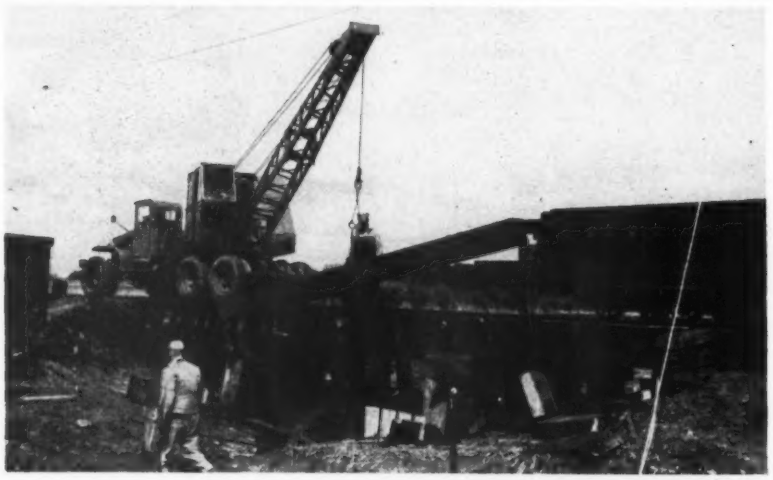
SEASON'S GREETINGS

Woodings FORGE & TOOL CO.

Woodings-Verona TOOL WORKS

HERE'S WHY SCHIELD BANTAM SELLS MORE 3/8 YD. MACHINES THAN ALL OTHERS COMBINED

BANTAM owners report that the mobile BANTAM (Crawler or Truck-Mounted) does more jobs at lowest operating and maintenance costs. They can contract for more work at a lower price per job. They can work later this fall because BANTAMS operate in soupy ground conditions where heavier rigs can't go.



TYPICAL EXAMPLES OF WHAT A BANTAM WILL DO

- ★ Load over 100 cubic yards per hour with shovel or clamshell
- ★ Dig 100 feet of 5 foot trench per hour with backhoe
- ★ Spot and drive piling
- ★ Lift up to 12,000 lbs. as a crane
- ★ Move at road speeds from job site to job site
- ★ Place concrete with bucket attachment
- ★ Handle scrap metal loading and unloading with magnet attachment

Contact your BANTAM distributor, get the full details of how the BANTAM method can boost production and cut costs for you. Or, fill in the coupon below and have Schield BANTAM send you a market kit telling you in detail how a BANTAM can fit your specific needs.

Write Today for your FREE KIT

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284 PARK ST., WAVERLY, IOWA, U.S.A.

World's Largest Producers of Truck-Cranes and Excavators

Please send me my FREE KIT with special information on what the BANTAM will do for me.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

TYPE OF OPERATION PARTICULARLY INTERESTED IN:

_____ RT-5

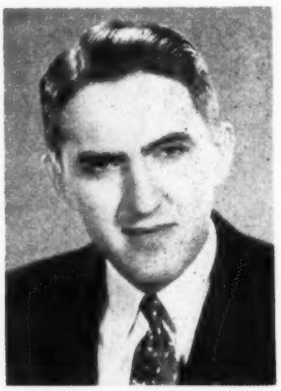
Railway Personnel (Cont'd.)

Special

Foster N. Snyder, assistant supervisor work equipment and welding on the Erie, has been appointed supervisor work equipment and welding with headquarters as before at Cleveland, Ohio, succeeding **Ernest H. Ness,** who retired October 31, after more than 37 years of service. **Nicholas A. Theobald** has been appointed district supervisor of work equipment at Meadville, Pa., succeeding **Anthony Kennedy,** who replaces Mr. Snyder as assistant supervisor work equipment and welding at Cleveland.

Robert C. Caldwell, formerly southwestern district manager for the Pullman-Standard Car Manufacturing Company, has been named to the newly created position of superintendent of work equipment on the Texas & Pacific at Dallas, Tex.

The announcement of Mr. Caldwell's appointment which appeared in the November issue on page 70 was inadvertently illustrated with a photograph of **Robert G. Caldwell,** district manager of the Gardner-Denver Company at Atlanta, Ga.



Robert C. Caldwell

Obituary

John T. Canty, retired assistant to engineer maintenance of way on the Boston & Maine, died recently at Melrose, Mass.

George Story, Jr., retired assistant engineer on the Southern, died recently at Cincinnati, Ohio.

Charles E. Dare, retired supervisor of track on the Richmond, Fredericksburg & Potomac, died recently at Birmingham, Mich.

Spencer R. Sproles, engineer of standards and research on the Gulf, Mobile & Ohio, died recently at Mobile, Ala.

George J. Sheppard, division engineer on the Atlantic Coast Line, died October 3 at Wilmington, N. C.

F. L. Stiner, supervisor track on the Illinois Central at Waterloo, Iowa, died recently.

(*Please turn to page* 64)

Here's the Gulf program

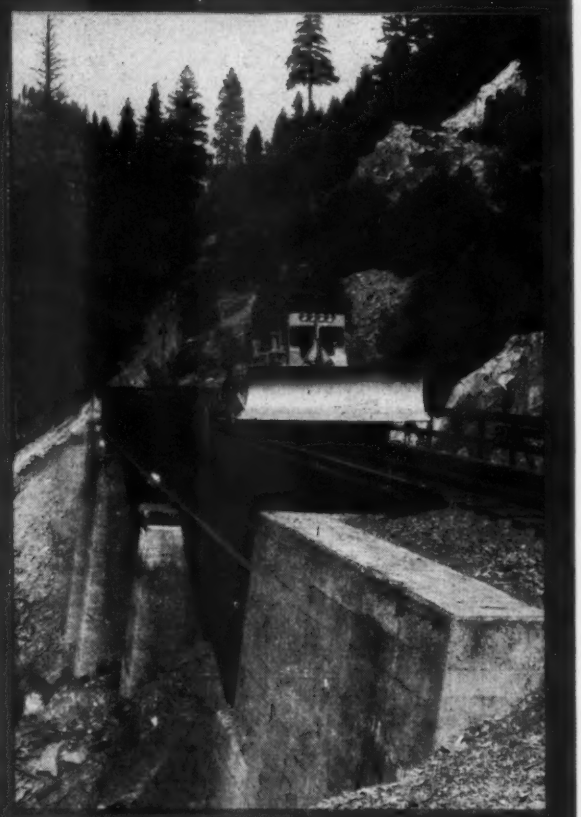
for better maintenance of your off-track equipment...

1 the use of uniform high quality lubricants and fuels throughout your system to keep equipment operating smoothly and continuously.

2 expert petroleum engineering counsel that will help lower your maintenance costs.

3 simplified lubricant storage and handling.

4 prompt lubricant delivery service when and where you need it.



Photograph courtesy of Le Tourneau-Westinghouse Company, a subsidiary of Westinghouse Air Brake Company.

GULF has a plan that incorporates all these essentials of a successful maintenance program. All you have to do to gain the advantages our plan offers is to contact your nearest Gulf office. A Gulf Sales Engineer is always available to help you put the program into operation throughout your system.

Gulf has had wide experience servicing the equipment of leading earth-moving contractors. This experience can aid you to gain smoother operation on every job.

A copy of the informative Gulf booklet, "Lubrication and Maintenance Guide for Contractors' and Allied Equipment," will be sent you upon request.

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Does the job faster... at lower cost!

Here's how...Check into the exclusive features of the Wellman-Browning Locomotive Crane and you'll see how it gives you:

Greater switching power. Drawbar pull is unsurpassed due to exclusive Torqflo hydraulic drive.

Smoother performance of hoist, swing, boom hoist and travel motions because of Torqflo and Metered Air Controls. Finger-tip control varies speed and power . . . eliminates jerks and shocks. Result:

Lower-cost operation. Gets the jobs done faster. Reduces wear on clutches, brakes, cables. Cuts maintenance costs.

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LOCOMOTIVE CRANES

Association News

American Railway Engineering Association

The association reports that both the September-October Bulletin, No. 517, and the November Bulletin, No. 518, include a large amount of information which members will want to review or read in detail, both for information and to be prepared for discussion at the 1955 annual meeting. No. 517 contains three research reports, while No. 518 contains the reports of seven committees on 27 different assignments and includes a number of Manual recommendations.

The Committee on Cooperative Relations with Universities, which includes 13 deans or professors of engineering in its membership, has inaugurated a new plan for holding future meetings. Instead of meeting only once a year at association headquarters in Chicago, the committee will endeavor to hold two meetings a year, one at the main headquarters or some key point of interest on a railroad member's road, and the other on the campus of one of the professorial members of the committee.

Railway Tie Association

The annual convention of the Railway Tie Association was held at the Mayflower Hotel, Washington, D. C., October 20-22. The meeting was attended by 421 persons, including 112 railroad men. J. E. Peterson, president of the association, and vice-president of Gross & Janes Co., St. Louis, Mo., presided.

New officers of the RTA, as elected at the convention, are: President—J. H. Tabb, J. H. Tabb & Co., Houston, Miss.; first vice-president—Douglas Grymes, Koppers Company, Inc., Pittsburgh; second vice-president—F. W. Campbell, W. B. Crane Company, Chicago; members of the Executive Committee—E. F. Schlafly, Potosi Tie & Lumber Co., St. Louis; W. L. Winham, T. J. Moss Tie Company, St Louis; Martin Wilson, Kirby Lumber Corporation, Beaumont, Tex.; D. B. Frampton, Jr., D. B. Frampton & Co., Columbus, Ohio. J. E. Peterson, as past president, also becomes a member of the Executive Committee. Roy M. Edmonds was re-elected secretary-treasurer.

Northwest Maintenance of Way Club

The December meeting will be held on the 16th at the Midway Civic Club, 1931 University avenue, St. Paul, Minn. The program will consist of a roundtable discussion of the various types of production tie tampers. Representatives of the Electric Tamper & Equipment Co., the Pullman-Standard Car Manufacturing

(*Continued on page* 66)

(AMENDED)

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION

Of Railway Track and Structures published monthly at Bristol, Conn. for December, 1954

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Simmons-Boardman Publishing Corp., 30 Church St., New York 7, N. Y.; Editor, Merwin H. Dick, 79 West Monroe St., Chicago 3, Ill.; Associate Editor, R. E. Dove, 79 West Monroe St., Chicago 3, Ill.; Business Manager, Fred W. Smith, 79 West Monroe St., Chicago 3, Ill.

2. The owners are: Simmons-Boardman Publishing Corp., 30 Church St., New York 7, N. Y. Stockholders of one percent or more, James G. and Louise Lyne, 30 Church St., New York 7, N. Y., Arthur J. McGinnis, 30 Church St., New York 7, N. Y., Conrad J. and Florence Wageman, 79 West Monroe St., Chicago 3, Ill., Joseph S. and Clarice Crane, 30 Church St., New York 7, New York, Frederick A. and Artimese B. Clark, 79 West Monroe St., Chicago 3, Ill., Samuel O. and Carrie E. Dunn, 79 West Monroe St., Chicago 3, Ill., Edward G. & Elizabeth Gavin, 79 West Monroe St., Chicago 3, Ill., Joseph or Katherine Sanders, 2909 Maple Ave., Dallas 4, Texas, John R. Thompson and Kathe Thompson, 79 West Monroe St., Chicago 3, Ill., Mae E. Howson, 6922 Paxton Ave., Chicago, Ill., Ella L. Mills and Catherine S. Mills, Westfield, N. J., Ruth Wheaton Johnson, 1615 Ravenna Blvd., Seattle 5, Wash., William E. Russell as Trustee L/W/T of Ida R. Simmons F/B/O, Mrs. E. S. Fenton, c/o Russell and Russell, 41 East 42nd St., New York 17, N. Y., J. Streicher & Co., 2 Rector St., New York, N. Y., Partners of J. Streicher & Co. are: Joseph Streicher, Jack L. Streicher, Ethel Streicher, Judson Streicher all of 2 Rector St., New York, N. Y., J. V. McManus, 39 Broadway, New York, N. Y.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

MERWIN H. DICK, Editor

Sworn to and subscribed before me this 15th day of November, 1954.

(Seal) RALPH E. WESTERMAN, Notary Public
(My commission expires February 3, 1957)

TRACK ACCESSORIES

JOINT BARS

ANGLE BARS

ANGLE BARS for OLD RAILS

PLAIN SPLICE BARS

TRACK SPIKES

Inquiries solicited.

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SAVE TRACK SPACE WITH Q AND C CAR STOPS

Q and C Car Stops are economical because they require very little track space and a minimum of labor for application. They wedge firmly to the rails. No drilling is necessary.

One size is suitable for all sections of rail used in yards and side tracks.

Specify them on your requisitions.

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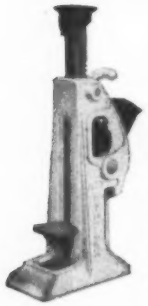
There's a SIMPLEX JACK to Do Every RAILROAD JOB Faster-Easier



Fast Acting TRACK JACKS

15 ton capacity. The jacks set much more firmly and stand straighter under tie (without damage) or rail, due to large area toe lifts. Trip from either side. Two models have light weight aluminum housings.

ALSO: Tie removers and replacers.

Standard Speed BRIDGE JACK

The new A2515 25-ton jack has an aluminum alloy housing, which weighs only 40 pounds. 9-in. lift eliminates re-setting in bridge work. Recommended for use with jack support.

ALSO: A complete line of hydraulic jacks and pullers.

Versatile BRIDGE JACK

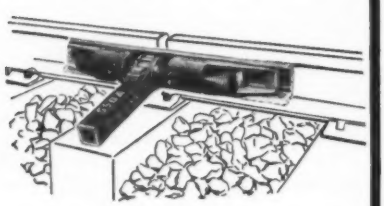
Lifts, pushes, pulls 15-tons on cap, toe or bolt attachment. Ideal for shimming, lining, painting and replacing timber decks. Two base sizes to fit between ties. Ratchet lowering for safety. Double socket permits use in close quarters.

ALSO: Push and pull jacks for piling.

Time-Saving TIE SPACER

Straightens, Spaces Ties. Pumps Rails. Easily applied and removed. Slides along top of rails.

RAIL EXPANDERS for the Maintenance and Signal Departments



Permits *one* man to replace a rail pounding crew! For lining crossings and switches, pushing or pulling continuous rail, controlling expansion or contraction with no interruption of service. With lever socket locked down, nothing protrudes above rail head.

Pole Pulling and Straightening Jacks for the Signal Department

Two sizes, 5 and 15 tons for pulling or straightening all sizes of poles. Pivots on base, when desired, to any angle. Can also be used for guy wire tightening or for pulling underground cable. Model A1538—15-ton capacity—available with aluminum housing which reduces weight 35 pounds.

ALSO: Cable Reel Jacks for drums 30- to 96-in. diameter.

WORLD'S LARGEST MFGRS. OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS

SIMPLEX JACKS

RE-MO-TROL UTIL-A-TOOL JENNY ROL-TOE

Write for Details in Bulletin RR 52

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Association News (Cont'd)

Company, the Railway Maintenance Corporation, the Nordberg Manufacturing Company and the Matisa Equipment Corporation will participate in the discussion. In addition, there will be a panel of railroad men and a moderator sitting with the participants.

Maintenance of Way Club of Chicago

The December meeting of the club will be held on the 13th. The principal speaker will be C. E. Weller, division engineer on the Illinois Central at Chicago, whose subject will be "Handling Maintenance in Large Terminals."

National Railway Appliances Association

An immeadiate and favorable response has been received to the announcement of the exhibition to be sponsored by the National Railway Appliances Association on March 14-17, 1955, at the Coliseum.

(*Continued on page* 68)

Organizations

American Railway Bridge and Building Association—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

American Railway Engineering Association—Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5. Next annual meeting, March 15, 16 and 17, 1955.

American Wood-Preservers' Association—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive street, St. Louis 1, Mo.

National Railway Appliances Association—J. B. Templeton, Secretary, Gardner Road, Broadview, Ill.; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Roy M. Edmonds, Secretary-Treasurer, 1221 Locust street, St. Louis 3, Mo. Next annual meeting, October 26-28, Peabody Hotel, Memphis, Tenn.

Roadmasters' and Maintenance of Way Association of America—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

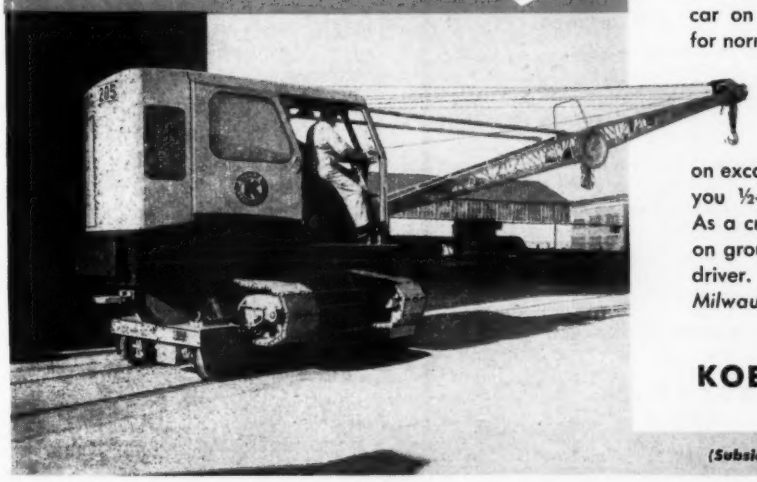
Works on or off the rail-propulsion car with all shovel or crane attachments

You get more productive work-time

because Koehring 205 saves travel-time . . . powers its own rail car

With Koehring 205 RailAid, it's not necessary to move off-track over round-about routes from one work section to the next. Self-powered RailAid travels on-track at speeds up to 20 m.p.h. . . . does 2 to 3 times the work of conventional excavators and cranes that have to crawl or be hauled from job to job.

You can send RailAid anywhere along the line at a moment's notice to do any digging, lifting or material-handling. It works on or off-track . . . cleans ditches, widens embankments, stock-piles coal or ballast, loads and unloads cars, repairs trestles, lays rails, does pile-driving, handles scrap or salvage.



It loads or unloads itself on ramp-equipped car in less than 10 minutes. Crane or excavator sets car on and off-track . . . clears the right-of-way for normal through traffic. Propulsion car has 2-axle drive, with airbrakes on all 4 wheels. Torque converter gives smooth control of 20 m.p.h. travel speed. Wide car-"well" accommodates 16, 20 or 24-in. crawlers on excavator or crane. Versatile Koehring 205 gives you ½-yard dipper capacity as a shovel or hoe. As a crane it safely lifts 6.9 tons from car, 8.9 tons on ground . . . converts to clamshell, dragline, pile-driver. For more facts, write: *Koehring Company, Milwaukee 16, Wisconsin.*

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Association News (Cont'd.)

Chicago, during the annual convention of the American Railway Engineering Association. Officers of the association report that many firms have asked for larger booth space. In addition, requests for space have been received from a number of new exhibitors. On the basis of these developments, it is expected that all available space in the three halls of the Coliseum will be required for the exhibition.

Further applications for space should be addressed to Lewis Thomas, director of exhibits, 59 East Van Buren street, Chicago 5.

Mississippi Valley Maintenance of Way Club

The next meeting will be held on December 13 at the Hotel De Soto, St. Louis. The principal speaker of the evening will be George J. Campbell, Johns-Manville Sales Corporation, whose subject will be "What's New in Building Materials for Your Home and for Your Railroad." In addition a moving picture will be exhibited showing how the Missouri Pacific removed heavy accumulations of dust from its tracks in western Kansas and eastern Colorado. The picture will be accompanied by a commentary by A. B. Chaney, assistant chief engineer—maintenance of the MP.

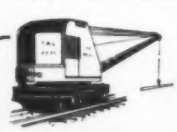
The November meeting, held on the 8th, was attended by 189 members and guests. As of that date, the membership of the club totaled 747.

Burro Cranes are the busiest units on the road because they can work anywhere . . . do virtually anything . . . and do it faster at lower cost. Burro's low overall height and short tail swing permit efficient operation on a flatcar . . . fast travel speeds and powerful draw bar pull give it a wider operating range on the track.

Write for Bulletins on Burro Cranes

Only **BURRO Cranes Give You All These Advantages**

- **Fast travel speeds . . . up to 22 MPH**
- **Draw bar pull of 7500 lbs. (often eliminates need for work train or locomotive)**
- **Elevated Boom Heels for working over high sided gondolas**
- **Short tail swing — will not foul adjoining track**
- **Low overall height — Burro can be loaded and worked on a standard flatcar.**



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Supply Trade News

General

The **Schield Bantam Company,** Waverly, Iowa, has announced to its distributors in the United States and Canada the availability of a special finance plan to help new customers buy or rent Bantam machines. The new plan can be used for any equipment model in Schield Bantam's line of crane carriers and crawler-mounted machines or for just the upper machine when a customer wishes to mount it on his own truck.

Personal

A. B. Drastrut, executive vice president of the **A. M. Byers Company,** has been elected president, succeeding **L. F. Rains,** who has retired after 23 years as president and a director.

F. A. Henry, assistant to the general manager of **A. O. Smith Corporation,** Milwaukee, Wis., has been named general manager of the firm's Pacific Coast works at Los Angeles. Mr. Henry succeeds **A. W. Shuman,** who has resigned.

Charles G. Hugus, Jr., Eastern District sales manager for the **L. B. Foster Company,** has been elected assistant vice-president with offices as in the past at New York City. A member of the Foster organization for 20 years, Mr. Hugus joined the company at Pittsburgh, later being transferred to New York in 1937 to engage in sales activities. He was appointed Eastern District sales manager in 1945.

Obituary

Raymond E. Miller, chief engineer, **Frog & Switch Department,** of the **Bethlehem Steel Company,** died recently at Steelton, Pa.

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for round columns of concrete

Warehouses, bridges, freight platforms and other railway structures can be built for less cost when SONOTUBE Fibre Forms are used.

Round columns of concrete formed with SONOTUBES save time, labor and money. Sizes 1" to 36" I.D. up to 50' long. Supplied in specified lengths or can be sawed to your requirements on the job.

For full information, write

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"WOLMANIZED*" ... clean pressure-treated lumber. Service-proved to be odorless, paintable, nonbleeding, noncorrosive

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Lumber
Stops Rot and Termites

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TAPECOAT®

the Coal Tar Protection in Handy Tape Form

The service behind TAPECOAT is as distinctive as this coal tar coating, itself.

To make this service as dependable as the product, the sales engineer who sells the job also services it. This means that you can count on everything he tells you because he is responsible for the job *personally*.

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Originators of Coal Tar Tape Protection

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Manufacturers' Literature

Following is a compilation of free literature, pamphlets and data sheets offered by manufacturers to the railroad industry. Circle the number (s) on the coupon below to receive the desired information; the requests will be sent direct by the manufacturers.

1. VACUUM CLEANING. *Wilson Engineering Corp.* Brochure (Bulletin 50) describes, illustrates, lists complete assemblies, and shows how to operate the Woodruff Syphon Jet Vacuum Cleaning System.

2. BUILDING MAINTENANCE. *Johns-Manville.* 12-page brochure (IP-9A) "Good Operating Practices" contains 101 suggestions for maintaining plant buildings and equipment, for using insulations, packings, refractory products, friction materials and roofings.

3. PHOTOGRAPHY IN PLANTS. *Eastman Kodak Company.* 8-page reprint "Today's Camera Techniques Save Time, Cut Costs" shows how photography could aid in standardizing procedures, spotting causes of equipment faults, recording construction progress, making stock pile surveys, etc.

4. TRACTOR-BACKHOE. *Allis-Chalmers Manufacturing Company.* 8-page booklet (MS982) "Get Big Earth-Moving Returns From a Small Investment in This Tractor-Backhoe Combination" describes, illustrates and gives specifications for the Allis-Chalmers Model WD-45 wheel tractor equipped with Henry backhoe and other Henry hydraulically operated attachments.

5. TRENCHERS & BACKFILLERS. *Cleveland Trencher Company.* 4-page 2-color bulletin (S-120) describes, illustrates and includes specifications for the entire line of Cleveland trenching equipment including the new Model 240 trencher and new Model 80W backfiller introduced during 1954.

6. WOOD-PRESERVING. *Pope & Talbot, Inc., Wood Preserving Dept.* 12-page report (AIA File #19-A-3 & #19-A-4) "The How and Why of Pressure-Treated Douglas Fir—Longer Lived and Stronger" lists uses, fully describes three types of treatment, and discusses factors affecting treatment of Douglas fir.

7. DRAINAGE STRUCTURES. *Armco Drainage & Metal Products Inc.* 6-page illustrated folder (P.O. 5554) "Dry, Fast Railroad Yards Make More Profit" discusses strength, corrosion and erosion resistance, simplified handling, low-cost installation, of Armco drainage structures.

8. CRAWLER TRACTOR. *Allis-Chalmers Mfg. Co.* 3-page cut-away view included in 30-page catalog which discusses, illustrates and gives specifications for the Allis-Chalmers HD-9 Diesel-powered crawler tractor.

9. PORTABLE POWER TOOLS. *Syntron Company.* 28-page binder-punched catalog (5410) describes, illustrates and gives specifications for Syntron portable power tools, including electric hammers, drills, screwdrivers, saws, and gas hammer paving breakers and rock drills.

10. SWITCH HEATERS. *Bethlehem Steel Co., Inc.* 4-page descriptive folder (602) "The Friendly Flame That Keeps Switches Ice-Free" describes Bethlehem's Winter King switch heaters.

11. AIR-COOLED ENGINES. *Kohler Co.* 3-color descriptive folder illustrates and gives specifications on four Kohler 4 cycle air cooled engines—the K90, K160, K330 and K660.

12. STEAM CLEANING. *Livingtone Engineering Co.* Bulletin (71C) describes, illustrates and gives power requirements for the Speedylectric Hydrasteam Jet Cleaner, includes specifications.

13. PAYLOADER ATTACHMENTS. *Frank G. Hough Co.* Literature "Useful Attachments For Payloader Tractor Shovels" shows 16 attachments available to adapt the Payloader to tasks in addition to bulk materials handling and earth-moving.

14. ENGINE-GENERATOR. *Le Roi Div. Westinghouse Air Brake Co.* 8-page 3-hole punched brochure (G-6) "LeRoi Generator Sets, 50 to 350 kw" describes and illustrates seven engine models from 60 to 675 hp. with generators capable of producing from 50 to 350 kw.

15. WROUGHT IRON PIPE. *A. M. Byers Co.* Technical data sheet on Byers wrought iron pipe for heating and plumbing lines, air conditioning piping, water supply, sanitary systems, etc., includes pipe sizes chart, dimensional data, and description of wrought iron's composition.

16. HARDNESS TESTER. *Andrew King.* 4-page 2-color folder describes and illustrates the King Portable Brinell Hardness Tester which can be taken to a job and used in any position anywhere.

17. SHOVEL CAB. *Crenlo, Inc.* Catalog sheet describes and illustrates the model 2431-AA cab for Caterpiller #6 shovels, includes complete specifications and installation details.

18. ENGINE GENERATORS. *Multi-Matic Corp.* Catalog-punched literature describes and illustrates the 1955 line of Gen-A-Matic portable gas engine generators and the new Super Hole-A-Matic line of one-man operated, portable earth boring machines.

Reader Service Department **DECEMBER, 1954**
Railway Track and Structures
30 Church Street, New York 7, N. Y.

Please send literature circled below:

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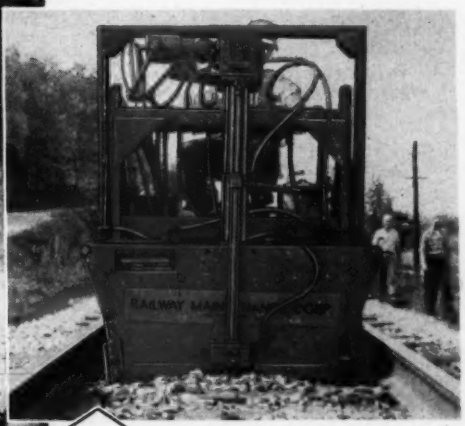
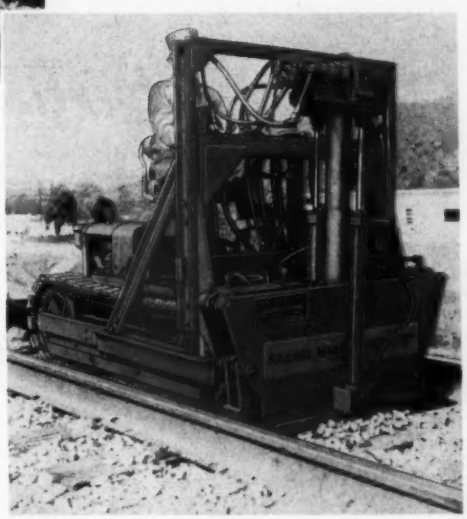
NEW MACHINE-

Lines up to 6,000 feet of track per day!

1: Lining head and spud anchor in moving position.



2: Head and spud anchor being lowered to lining position.



3: Machine in lining position with spud anchor driven into the roadbed.

R·M·C· LINEMaster

The LineMaster requires two men —an operator and a man for sighting. It is capable of making throws up to 6". Machine does not obstruct sighting of the rail on either side. Track is not raised by the lining operation.

The LineMaster is mounted on a hydraulically driven crawler tractor which operates on the ties between the rails. Can be removed from the track at any point, using turntable carried on the machine—or at a crossing without turntable. *Ask for Bulletin No. 1154.*

Railway Maintenance Corporation

PITTSBURGH 30, PA.

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CUT WIRE ROPE
THE FAST EASY WAY

MANCO
GUILLOTINE HYDRAULIC
CUTTER

Guillotine
Model 10-A

In a matter of seconds you can cut up to 1¼" wire rope on the job with the new Manco Guillotine. Develops 22½ tons thrust with easy hand pump action. Available with high speed electric hydraulic pump for production applications. Other models to cut chain or reinforcing rod.

Portable...Easy to Use

A click of the latch opens the anvil. Lay in material to be cut. To lock, raise main body of tool back to vertical. Pumping action makes cut. Positive blade retraction. Wt. 45 lbs.

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hook bolt

All products are manufactured in the U.S.A. to A.S.T.M. specifications

A highly dependable, superior bolt used in bridge and trestle construction. Forged from S.A.E. 1045 steel. Patented fins prevent turning. Sealtite washer nut adds strength, stops seepage. *Available in Hot-Dip Galvanized finish for greater durability and economy.*

Also available with std. sq. and hex. nuts.

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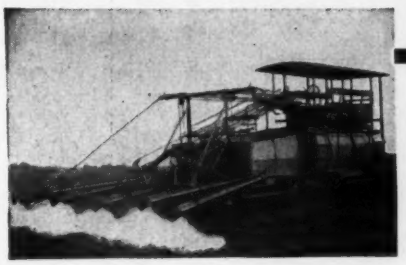
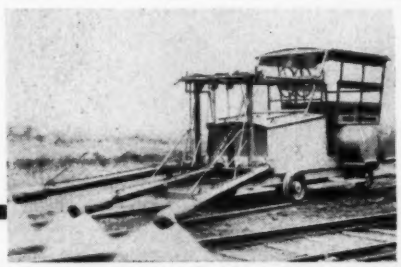
DESTROY WEEDS

with WOOLERY WEED BURNERS



MODEL WBZ—WOOLERY GIANT OCTOPUS (shown at right) is the favorite for heavy duty requirements. Will destroy a swath 25 feet wide in one trip or up to 35 feet with burner arms extended on second trip.

Model WBF—WOOLERY MIDGET OCTOPUS (shown at left) is recommended for normal requirements and has all the features of its bigger brother. Has three burners instead of five and will burn a swath 15 feet wide on first trip and 25 feet on the second.



Model PB-B—WOOLERY WEED BURNER trailer type (not shown) can be towed by motor car. Three burners clear a swath 15 feet wide on first trip and if required can be widened to 25 feet with burners extended on second trip. Woolery Weed Burners are available in 4 sizes to meet your needs for effective, low cost roadbed maintenance. Burner jets are individually controlled and will destroy ALL types of weeds on roadbeds, embankments and ditches. Can also be used in winter for melting ice and snow.

Manufacturers of Tie Cutters, Tie End Removers, Tie End Trimmers, Power Bolt Tighteners, Spike Drivers, Motor Cars, Push Cars, Tool Transporters, Weed Burners, Extinguisher Cars, Chemical Sprayers, Tie Plate Spacers, Creosote Tie Sprayers, Rail Nippers, Flangeway Cleaners, Rail Joint Oilers, Power Joint Lubricators.

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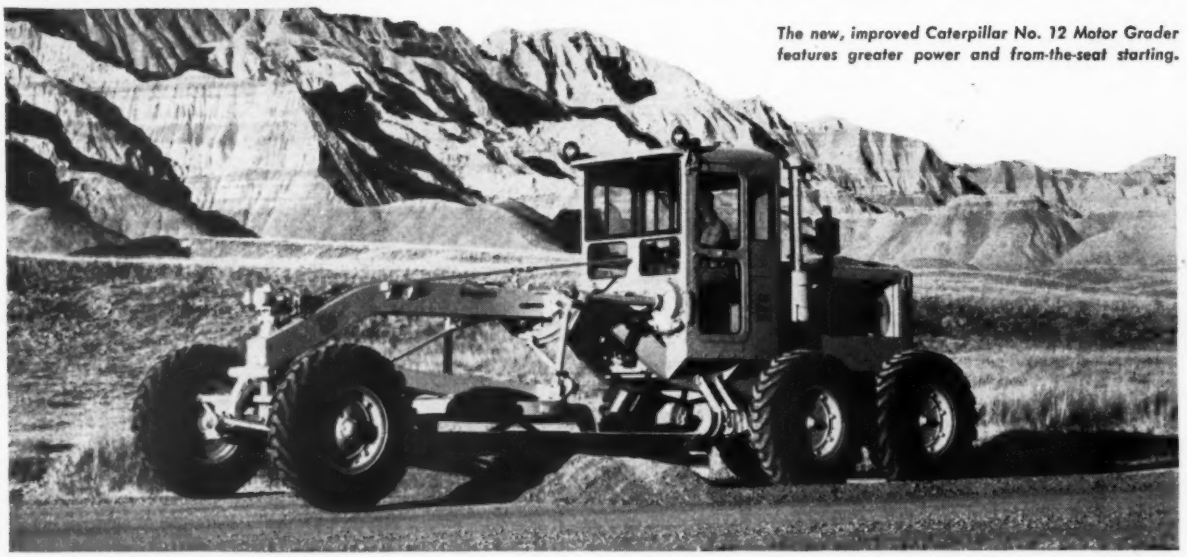
115 HORSEPOWER

A 15% INCREASE IN POWER

NO INCREASE IN PRICE



The new, improved Caterpillar No. 12 Motor Grader features greater power and from-the-seat starting.

NEW in BOTH No. 12 and No. 112

One-lever from-the-seat starting

Accelerator-decelerator pedals

Improved hand throttle

Redesigned instrument panel in easy-to-read location

No increase in price

Now there's a new high in performance in CAT* Diesel No. 12 and No. 112 Motor Graders. In keeping with Caterpillar's policy of constant product improvement, both these rugged machines incorporate new features that increase their profit-making capacity. The new No. 12 packs more power, 115 HP—and has faster reverse speeds—low reverse, 4 m.p.h.; high reverse, 6.3 m.p.h. For durability, the capacity of the transmission and clutch has been increased to match the greater horsepower. Other improvements, standard in both the No. 12 and No. 112, are: convenient one-lever from-the-seat starting and the accelerator-decelerator pedals that permit changing speeds without changing throttle setting.

With these and other new features, you can figure on even *more* work at lower cost from the No. 12 and No. 112. Along with the No. 212, they are the only motor graders whose major components are built entirely by one manufacturer and serviced by one organization. Their performance record is unmatched—more than 99% ever built are still in use. Ask your nearby Caterpillar Dealer to show you how these machines can step up production and profits for you!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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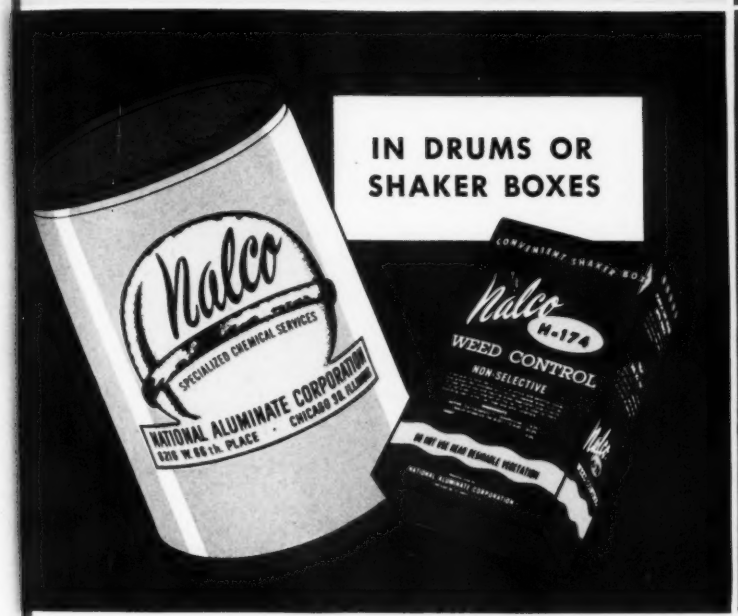

Nalco H-174

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Nalco MECHANICAL SPREADERS

Nalco H-174 granular Weed Control Chemical, distributed with Nalco Track Mechanical Spreaders, is the fast, positive way to get full-season weed control in yards, along sidings and right-of-way. Around buildings, bridge and trestle footings and in other hard-to-reach places, the portable or off-track Mechanical Spreaders or the convenient Nalco H-174 Shaker Box do the job quickly, without waste.

Nalco H-174 action is powerful and lasting. One treatment, preferably before emergence, provides sufficient treatment to prevent growth during the season. Application after emergence provides a thorough kill and stays in the soil for months to prevent regrowth. H-174 is non-hazardous to humans and animals; safe to store and handle.

Your weed control requirement will determine the type of Nalco Mechanical Spreader best suited to your use. Whether manually-operated sling-type, mechanically-driven push-cart, or push-car-mounted, these spreaders are designed to give you accurate dosage control and excellent distribution of Nalco H-174.

Full data and prices on Nalco Weed Control Chemicals and Spreaders will be sent promptly upon request. Act now for a successful start on a one-treatment, all-season weed control program.

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FREE-FLOWING Nalco H-174 will not pack or clog in drums, boxes or spreaders. Uniformly-sized granules assure even distribution, eliminate dust nuisance and waste.

Nalco

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FIRST STEP: Spray on a coat of *Texaco Bridge Cement* to seal existing cracks and prevent further splitting by sealing out moisture, brine drippings, etc.

SECOND STEP: Cover the coating of *Texaco Bridge Cement* with clean small crushed stone for a longer lasting surface that extends tie and stringer life and adds protection against fire.

FINISHED JOB: *Texaco Bridge Cement* grips the crushed stone, does not become brittle, chip or peel. Lasts for years, yet costs only pennies per tie.

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